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# Funding Discipline for U.S. Public Pension Plans: An Empirical Analysis of Institutional Design

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# Funding Discipline for U.S. Public Pension Plans: An Empirical Analysis of Institutional Design

Natalya Shnitser\*

*ABSTRACT: Using newly collected data on over 100 state-administered pension plans, this Article shows that previously overlooked differences in institutional design are associated with the striking variation in funding discipline across U.S. public pension plans. As state and local governments grapple with unfunded pension obligations, this Article presents a timely examination of public plan governance across two key dimensions: the allocation of control over funding decisions and the transparency with respect to funding liabilities. It shows empirically that greater constraints on legislative control over funding decisions—typically through the delegation of control to pension-system boards—have been associated with better funding discipline. Conversely, liability-pooling arrangements that have shrouded individual employer responsibility for underfunding have been associated with worse funding discipline. These findings should inform current reform efforts to address the multi-trillion dollar shortfall in pension funding. To date, such state and local government efforts have focused primarily on scaling back benefits for public employees but have overlooked the role of institutions in explaining why some public employers have consistently contributed to the pension funds while others have failed to set adequate contribution rates or have withheld promised funds.*

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## I. INTRODUCTION

In recent years, the underfunding of public pension plans across the United States—totaling between \$1 and \$3 trillion dollars in the aggregate<sup>1</sup>—has contributed to ballooning budget deficits, municipal bankruptcies,<sup>2</sup> and increasingly dramatic calls for public pension reform.<sup>3</sup> The lack of funding discipline on the part of some public employers, as measured by the failure of such employers to meet the annual contribution benchmarks recommended by the Governmental Accounting Standards Board (“GASB”), has been a significant culprit.<sup>4</sup> Despite the widespread consensus that meeting these benchmark contribution targets is essential for the responsible management of long-term pension liabilities, U.S. public employers have exhibited tremendous variation in funding discipline, with some consistently making the recommended pension payments but others habitually skipping or underpaying the target contributions.

Using newly collected data on 110 state-administered public pension plans, this Article shows that previously overlooked differences in plan-level

1. Joshua Rauh, *The Pension Bomb*, MILKEN INST. REV., Jan. 2011, at 28, 32, available at <http://assets1c.milkeninstitute.org/assets/Publication/MIRreview/PDF/26-37.mr49.pdf>. See generally ALICIA H. MUNNELL ET AL., CTR. FOR RET. RESEARCH AT BOS. COLL., *THE FUNDING OF STATE AND LOCAL PENSIONS: 2012–2016* (2013), available at [http://ctr.bc.edu/wp-content/uploads/2013/07/slp\\_32-508.pdf](http://ctr.bc.edu/wp-content/uploads/2013/07/slp_32-508.pdf).

2. In recent years, a number of municipalities, including Vallejo, California, in 2008, Central Falls, Rhode Island, in 2011, Stockton, California, and Mammoth Lakes, California, in 2012, and Detroit, Michigan, in 2013, have filed for bankruptcy in part due to the burden of pension obligations. See, e.g., Monica Davey & Mary Williams Walsh, *Billions in Debt, Detroit Tumbles into Insolvency*, N.Y. TIMES (July 18, 2013), <http://www.nytimes.com/2013/07/19/us/detroit-files-for-bankruptcy.html>; Elizabeth Trotta, *Stockton Teeters on Bankruptcy Edge, but City's Not Alone*, THE EXCHANGE (June 27, 2012, 3:00 PM), <http://finance.yahoo.com/blogs/the-exchange/stockton-teeters-bankruptcy-edge-city-not-alone-190026487.html>.

3. In the same period, most states scaled back pensions for new employees, and a number of states reduced pension obligations to current employees and retirees. See U.S. GOV'T ACCOUNTABILITY OFFICE, *STATE AND LOCAL GOVERNMENT PENSION PLANS: ECONOMIC DOWNTURN SPURS EFFORTS TO ADDRESS COSTS AND SUSTAINABILITY 21* (2012), available at <http://www.gao.gov/assets/590/589043.pdf>; see also John W. Schoen, *Pandemic of Pension Woes Is Plaguing the Nation*, CNBC (Nov. 19, 2013, 6:00 AM), <http://www.cnbc.com/id/100929269>; Christine Williamson, *Motor City as a Motivator: Detroit's Woes Seen Likely to Push Others to Resolve Their Pension Underfunding*, PENSIONS & INVS. (Aug. 5, 2013), <http://www.pionline.com/article/20130805/PRINT/130809965/motor-city-as-a-motivator>. In July of 2013, Senator Hatch proposed “a way for states and cities to exit the pension business.” Mary Williams Walsh, *Pension Proposal Aims to Ease Burden on States and Cities*, N.Y. TIMES (July 9, 2013, 12:01 AM), <http://dealbook.nytimes.com/2013/07/09/pension-proposal-aims-to-ease-burden-on-states-and-cities>. Under the proposal, local governments would hold annual auctions to purchase annuity contracts for their employees. In the course of the working years, an employee would collect a series of annuity contracts that, in the aggregate, would substitute for a pension. The public employer’s liability would consist only of the upfront payment to the insurer. *Id.*

4. The GASB is a private, not-for-profit entity that sets standards for accounting and financial reporting by state and local governments. *Facts About GASB*, GOV'T ACCT. STANDARDS BOARD, [http://www.gasb.org/jsp/GASB/Document\\_C/GASBDocumentPage&cid=1176163065939](http://www.gasb.org/jsp/GASB/Document_C/GASBDocumentPage&cid=1176163065939) (last visited Oct. 29, 2014).

institutional design are associated with the variation in funding discipline. The analysis exploits the lack of federal regulation for public plans, which has left the governance of such plans to highly variable, plan-specific rules. Across the plans examined in this Article, there are significant differences in the employees and employers covered, the composition of the governing system boards, the control afforded to the state legislatures, the allocation and disclosure of liabilities, and even the statutory and constitutional constraints on pension funding. Such variation presents a unique opportunity to study how different public employers have managed long-term liabilities and how legal institutions have been used to constrain the inherent principle-agent problems and the tendency of political actors “to prefer the present to the future.”<sup>5</sup>

The focus of the analysis in this Article is on institutional variation across two key dimensions: the allocation of control over funding decisions and the transparency with respect to funding liabilities. The results of the empirical analysis indicate that greater delegation of control over funding decisions to pension system boards has been associated with better funding discipline. Conversely, the widely adopted “cost-sharing” arrangements that have permitted municipal and state employers to pool assets and liabilities without delineating responsibility for underfunded pools, in conjunction with lax disclosure requirements, have been associated with worse funding discipline. Thus, even though all U.S. public pension plans can be characterized by political promises of future benefits and powerful incentives to shirk on current funding for such promises, institutions that facilitate transparency and pre-commitment to actuarially determined funding policies may mitigate the shifting of current pension costs to future taxpayers.

This study of plan-level decision-making fills an important gap in the scholarship on U.S. public pension plans. While prior research has identified the tremendous funding challenges faced by many public pension plans in the U.S. and has explored the legal ramifications of changes to benefits promised to retirees and current employees, the analysis of funding discipline at the employer level has been “embryonic.”<sup>6</sup> Most of the analyses to date, as well as the policy recommendations based on these analyses, have taken state-level snapshots of the pension funding data. By aggregating financial information about different pension plans within states, such analyses have overlooked important in-state variation and have failed to explore

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5. STATE BUDGET CRISIS TASK FORCE, FULL REPORT 45 (2012), available at <http://www.statebudgetcrisis.org/wp-content/images/Report-of-the-State-Budget-Crisis-Task-Force-Full.pdf>. Highlighting the challenges faced by public pension plans, the Task Force Chairmen Richard Ravitch and Paul Volcker emphasize that “[i]t is human nature to prefer the present to the future. Governments display that time preference by promising now and paying later: if they can, they will underestimate liabilities, underfund annual costs, and take on substantial investment risks to make it look like promises will be kept.” *Id.*

6. ALICIA H. MUNNELL, STATE AND LOCAL PENSIONS: WHAT NOW? 75 (2012).

systematically why certain plans have been so much better than others at achieving funding discipline in the face of budgetary pressures and competing priorities. The failure to answer this question has necessarily limited the range of state and local government policy solutions, most of which have thus far focused on temporary cutbacks in benefits or increases in employee contributions, rather than on long-term structural reforms.<sup>7</sup>

This Article disaggregates the state pension data and harnesses newly collected data on the institutional differences at the plan level to systematically analyze the factors affecting funding discipline. Part II introduces the public plan infrastructure, presents the findings of prior scholarship, and identifies the gap in our understanding of how certain statutory and constitutional provisions impact long-term funding discipline. Part III catalogs previously unexplored institutional differences among pension plans and sets forth the testable hypotheses regarding their impact on funding discipline. Part IV describes the dataset and the empirical methodology. Part V presents the analysis and results. Part VI discusses the policy implications that follow from these empirical findings. Finally, Part VII concludes.

## II. FUNDING DISCIPLINE

### A. OVERVIEW OF PUBLIC PENSIONS

Unlike private sector retirement systems, public pension plans are still predominately defined benefit arrangements, whereby workers are promised a specified monthly benefit at retirement, often calculated through a formula that considers final salary and years of service.<sup>8</sup> Most states have multiple pension “plans” to cover different segments of government employees. As used in this Article, a pension plan refers to a program that offers a set of pension benefits to eligible participants.<sup>9</sup> Approximately half of the states maintain separate statewide plans for teachers, and most states also maintain

7. See, e.g., *Selected Approved Changes to State Public Pensions to Restore or Preserve Plan Sustainability*, NAT'L ASS'N ST. RETIREMENT ADMINS. (2014), <http://www.nasra.org/files/Compiled%20Resources/nasrasustainabilitychanges.pdf>.

8. For example, a worker might be entitled at retirement to 2% of final average salary for each year worked. An employee who has worked for 30 years for the particular employer would be entitled 60% of her final average salary; an employee whose final average salary was \$100 per year would be entitled to \$60 per year in pension benefits, not counting retiree healthcare benefits.

9. According to the U.S. Census Bureau, there were 3418 U.S. public pension plans in 2010, of which 222 were administered at the state (rather than the municipal) level. Membership in these 222 state-administered pension plans comprised 89.6% of the total U.S. public pension plan membership. Of the 3196 locally administered plans, approximately 2200 covered local units in just three states: Pennsylvania (1425 plans), Illinois (457 plans), and Florida (303 plans). See ERICA BECKER-MEDINA, U.S. CENSUS BUREAU, PUBLIC-EMPLOYEE RETIREMENT SYSTEMS STATE- AND LOCALLY-ADMINISTERED PENSIONS SUMMARY REPORT: 2010, at 5 (2012), available at <http://www.census.gov/prod/2012pubs/g10-aret-sl.pdf>.

separate and often relatively more generous plans for judges, legislators, and public safety officers.<sup>10</sup>

To manage and administer pension plans, states have set up pension “systems,” which are generally separate legal entities governed by boards of trustees. In a common scenario, one system administers several plans for state and local general employees, legislators, and judges, and a separate system administers a pension plan for teachers. A state-administered pension system may administer plans that cover only employees of the state or it may administer plans that cover employees of both state and municipal employers. A few state-administered systems—like the Illinois Municipal Retirement Fund—administer plans that cover only the employees of participating municipal governments.<sup>11</sup> To illustrate the possible permutations in the organization of state-administered pensions, Appendix A provides an overview of the pension systems and plans in Hawaii, Massachusetts, and Missouri.

In stark contrast to the 401(k)-type defined contribution plans that are pervasive in the private sector, public sector defined benefit plans allocate the management and investment risk to the employers, thus making the employers liable for the promised amounts regardless of investment performance in any given period. Furthermore, while the federal Employee Retirement Income Security Act of 1974 (“ERISA”) imposes funding requirements on all defined benefit plans established by private sector employers, state and municipal plans are virtually free from any federal oversight.<sup>12</sup> The state and municipal governments that make the pension promises are therefore also in charge of putting aside the money to fund such long-term liabilities. Although early public pension plans were operated on a pay-as-you-go model, over time states began to link pension contribution levels to actuarial calculations—such that the cost of future benefits “earned” by an employee in a given year would be covered by employee and employer contributions in that same year.<sup>13</sup> Returns from the investment of such

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10. JUN PENG, STATE AND LOCAL PENSION FUND MANAGEMENT 16–17 (2009).

11. See, e.g., 40 ILL. COMP. STAT. 5/7-132 (2005 & Supp. 2014) (describing elective participation procedures for “any city, village, or incorporated town that attains a population over 5000 inhabitants” in the Illinois Municipal Retirement Fund); *About IMRF*, ILL. MUNICIPAL RETIREMENT FUND, <http://www.imrf.org/info/about.htm> (noting that, with the exception of the City of Chicago and Cook County, the IMRF has provided retirement benefits to the employees of local governments and school districts in Illinois since 1941).

12. Employee Retirement Income Security Act of 1974, Pub. L. No. 93-406, 88 Stat. 829. ERISA establishes mandatory pre-funding requirements for private employer plans and regulates the discounting of liabilities. If a plan is not fully funded, for example, the employer’s annual contribution must include the amount necessary to amortize over seven years the difference between its liabilities and its assets. Stricter rules apply to severely underfunded plans. 29 U.S.C. §§ 1001–1461 (2013).

13. See generally Thomas J. Fitzpatrick IV & Amy B. Monahan, *Who’s Afraid of Good Governance? State Fiscal Crises, Public Pension Underfunding, and the Resistance to Governance Reform*, 66 FLA. L. REV. 1317 (2014). For example, “[i]n 2006 . . . the median contribution rate was 8.5% of payroll

contributions would also be used to cover benefits.<sup>14</sup> Today, a “fully funded” plan is a plan that has accumulated sufficient assets to cover all accrued benefits.<sup>15</sup>

### B. VARIATION IN FUNDING DISCIPLINE

Much of the recent scholarly and policymaker attention has focused on calculating the deviation from the fully-funded ideal and on comparing states based on the average funding levels of their pension plans.<sup>16</sup> The Pew Center has reported a trillion-dollar gap between the present value of the promised retirement benefits and the available assets.<sup>17</sup> In a 2012 report, the Pew Center also observed that 16 states lacked funding for more than a third of their pension liabilities, while 34 states had pension liabilities that were less than 80% funded.<sup>18</sup> Meanwhile, some finance scholars have challenged the methods used by plans in their liability calculations and have argued that the real funding gap has been closer to \$3 trillion, or more than \$20,000 per U.S. household.<sup>19</sup>

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for state and local government employers and 5% for employees [in] plans in which employees [were] also covered by Social Security;” for plans in which the employees were not covered by Social Security, the rates were 11.5% of payroll for employers and 8% for employees. Jonathan Barry Forman, *Funding Public Pension Plans*, 42 J. MARSHALL L. REV. 837, 840 (2009) (citing BARBARA D. BOVBJERG, U.S. GOV’T ACCOUNTABILITY OFFICE, STATE AND LOCAL GOVERNMENT PENSION PLANS: CURRENT STRUCTURE AND FUNDED STATUS (2008), available at <http://www.gao.gov/new.items/do8983t.pdf>).

14. See generally Olivia S. Mitchell, *Public Pension Pressures in the United States*, in WHEN STATES GO BROKE: THE ORIGINS, CONTEXT, AND SOLUTIONS FOR THE AMERICAN STATE IN FISCAL CRISIS 67–71 (Peter Conti-Brown & David A. Skeel Jr., eds., 2012).

15. See, e.g., MUNNELL, *supra* note 6, at 20 (noting that “[a] plan is fully funded when its assets equal its liabilities”).

16. See, e.g., JAGADEESH GOKHALE, CATO INST., FUNDING STATUS, ASSET MANAGEMENT, AND A LOOK AHEAD: STATE AND LOCAL PENSION PLANS (2012), available at <http://www.cato.org/sites/cato.org/files/pubs/pdf/Gokhale-WP-State-and-Local-Pension-Plans.pdf>; PEW CTR. ON THE STATES, THE WIDENING GAP UPDATE (2012), available at [http://www.pewtrusts.org/~media/legacy/uploadedfiles/pes\\_assets/2012/PewPensionsUpdatepdf.pdf](http://www.pewtrusts.org/~media/legacy/uploadedfiles/pes_assets/2012/PewPensionsUpdatepdf.pdf); U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 3; Robert Novy-Marx & Joshua D. Rauh, *Policy Options for State Pension Systems and Their Impact on Plan Liabilities*, 10 J. PENSION ECON. & FIN. 173 (2011); Robert Novy-Marx & Joshua Rauh, *Public Pension Promises: How Big Are They and What Are They Worth?*, 66 J. FIN. 1211 (2011). See generally MUNNELL ET AL., *supra* note 1.

17. PEW CTR. ON THE STATES, *supra* note 16, at 1.

18. *Id.* at 5.

19. Rauh, *supra* note 1, at 32. Economists such as Brown, Wilcox, and Rauh have posited in a series of influential articles that pension plans are understating the amounts of unfunded liabilities by using a discount rate that reflects expected returns on assets instead of the riskiness of the liabilities. See Jeffrey R. Brown & David W. Wilcox, *Discounting State and Local Pension Liabilities*, 99 AM. ECON. REV. 538, 538 (2009). The authors point out that linking the discount rate to the expected return allows pension plan sponsors, against all findings of conventional finance theory, to reduce their liabilities by investing in riskier securities because a higher discount rate will result in a smaller present value of liabilities. See *id.*; see also MUNNELL ET AL., *supra* note 1, at 4 (noting that using a discount rate of 5% instead of 8% increased the aggregate liability from \$3.8 trillion to \$5.5 trillion); Andrew G. Biggs, *Understanding the True Cost of State*



Although the generosity of public sector pension benefits and the investment losses suffered in the last recession have been widely blamed for the funding gaps,<sup>20</sup> experts have identified the lack of funding discipline—defined here as the failure by public employers to make consistent payments of the so-called “annual required contribution”—as a very serious, non-market related cause of pension underfunding for some plans.<sup>21</sup> The GASB defines the “annual required contribution” (“ARC”) as the annual contribution that a public employer must pay into its pension fund to cover the cost of benefits accrued in that year and to pay off any accrued unfunded liabilities in no more than 30 years.<sup>22</sup> Even though making the full ARC payments is considered essential for the responsible management of long-term liabilities,<sup>23</sup> public employers have exhibited tremendous variation in funding discipline, with some states and localities consistently making the full ARC payments but others habitually skipping or underpaying their ARCs.<sup>24</sup> In 2010, fewer than

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*and Local Pensions*, 63 ST. TAX NOTES 565, 565–66 (2012). In 2012 the GASB adopted new standards that, for purposes of disclosure only, impose certain restrictions on the use of the expected rate of return as the discount rate. *See infra* Part VI.A.

20. *See, e.g.*, Josh Barro, *Dodging the Pension Disaster*, 7 NAT’L AFF. 3, 4–5 (2011) (finding that one “fundamental problem” with the pension plans offered by state and local governments all across America is that “in many cases, the benefits are excessively costly, insofar as they are more generous than is necessary to attract qualified talent to government work”); Biggs, *supra* note 19, at 565 (stating that funding shortfalls were caused by “market declines, funding holidays, and benefit increases passed during the prosperous days of the late 1990s”).

21. *See, e.g.*, STATE BUDGET CRISIS TASK FORCE, *supra* note 5, at 37.

22. *See* GOV’T ACCOUNTING STANDARDS BD., GUIDE TO IMPLEMENTATION OF GASB STATEMENTS 25, 26, AND 27 ON PENSION REPORTING AND DISCLOSURE BY STATE AND LOCAL GOVERNMENT PLANS AND EMPLOYERS: QUESTIONS AND ANSWERS 13–15 (1997), *available at* [http://www.gasb.org/jsp/GASB/Document\\_C/GASBDocumentPage?cid=1176163117979&acceptedDisclaimer=true](http://www.gasb.org/jsp/GASB/Document_C/GASBDocumentPage?cid=1176163117979&acceptedDisclaimer=true).

23. *See, e.g.*, PEW CTR. ON THE STATES, *supra* note 16, at 6 (“Keeping up with the annual required contribution is perhaps the most effective way that states can responsibly manage their long-term liabilities for public sector retirement benefits.”). The Pew Center’s “research shows that states that consistently make their full payments have better-funded retirement systems and smaller gaps.” *Id.*; *see also* FITCH RATINGS, ENHANCING THE ANALYSIS OF U.S. STATE AND LOCAL GOVERNMENT PENSION OBLIGATIONS 3 (2011), *available at* [http://www.ncpers.org/Files/2011\\_enhancing\\_the\\_analysis\\_of\\_state\\_local\\_government\\_pension\\_obligations.pdf](http://www.ncpers.org/Files/2011_enhancing_the_analysis_of_state_local_government_pension_obligations.pdf) (“The systems that pose the greatest risks are those with significant unfunded liabilities for which the government’s annual payments have been significantly less than an actuarially determined ARC over multiple years.”); JUN PENG & ILANA BOIVIE, NAT’L INST. ON RET. SEC., LESSONS FROM WELL-FUNDED PUBLIC PENSIONS: AN ANALYSIS OF SIX PLANS THAT WEATHERED THE FINANCIAL STORM 6 (2011), *available at* <http://www.ncpublicschools.org/docs/humanresources/benefits/lessons-pensions.pdf> (“The most fundamental principle in ensuring a plan achieves a 100% funding ratio is ensuring that the plan sponsors pay the entire amount of the annual required contribution (ARC) each year, because anything short of a full ARC payment will have a negative impact on the plan’s funding ratio in the long run.”).

24. The variation can be seen across plans of varying benefits levels, such that the lack of funding discipline is not a problem only for relatively more generous plans. *See generally* MUNNELL, *supra* note 6.

65% of state-administered plans<sup>25</sup> received the full ARC contribution.<sup>26</sup> Between 2001 and 2010, for example, the California Public Employees Retirement plan received 100% of the ARC, while the California State Teachers Retirement plan received on average only 76%. The Illinois State Teachers and the Illinois State Employees plans received on average only 71% of the ARC, while the Illinois Municipal Retirement plan received 99%.<sup>27</sup>

The measure of funding discipline through the use of the ARC benchmark reflects the unique regulatory environment for public pension plans, in which GASB standards have had a profound impact on funding policies. Since public plans are not covered by ERISA and not subject to federal oversight, the only source of standardization has come from the GASB. Although GASB standards are not federal law and GASB has no enforcement authority, its reporting standards are generally recognized by state and local governments as authoritative, and compliance with such standards has come to be expected for participation in the market for municipal debt.

In particular, under GASB standards in effect through 2014,<sup>28</sup> each plan has had to disclose each year its ARC for that year and for the six prior years, as well as the actual contributions received from employers or the state. Although called the annual “required” contribution, because GASB has no enforcement authority over state or municipal governments, the ARC has referred only to the contribution amount that would satisfy GASB’s parameters for actuarially sound funding.<sup>29</sup> Nevertheless, the percentage of the ARC actually contributed has been an important benchmark of funding discipline across public pension plans.<sup>30</sup>

25. As used throughout this Article, “state-administered” plans include plans created by state statute that pool together, at least for administrative and investment purposes, employees of participating municipalities or other local entities, even if the pension system that administers such plans is legally separate and fiscally independent from the state.

26. Calculated by author using data on 110 plans. For additional background on the structure of retirement plans and systems, and on the data collection techniques, see *infra* Part IV.

27. Calculated by author using data from the Boston College Center for Retirement Research. For additional background on the data collection techniques, see *infra* Part IV.

28. In 2012, GASB adopted a series of changes, including the elimination of the ARC disclosure requirement. For a discussion of such changes, see *infra* Part VI.

29. In particular, any unfunded actuarial accrued liability must be funded over a period not to exceed 30 years (40 years prior to 2006). Additional parameters for the ARC calculation are set forth in GASB STATEMENT NO. 25, GOV’T ACCOUNTING STANDARDS BD., FINANCIAL REPORTING FOR DEFINED BENEFIT PENSION PLANS AND NOTE DISCLOSURES FOR DEFINED CONTRIBUTION PLANS 17 (1994), available at [http://www.gasb.org/jsp/GASB/Document\\_C/GASBDocumentPage?cid=1176160029908&acceptedDisclaimer=true](http://www.gasb.org/jsp/GASB/Document_C/GASBDocumentPage?cid=1176160029908&acceptedDisclaimer=true).

30. The ARC measure is informative but imperfect. It is not completely standardized and may reflect the variation in certain actuarial assumptions and methodologies heretofore permitted by the GASB. For example, particularly rosy assumptions about expected rates of return, dim projections about salary growth, and a rolling 30-year amortization period are all means to decrease the amount of the “required contribution.” Certain tactics recently employed by a handful of states—such as permitting an employer to borrow from the plan to make the required contribution—also cloud the meaning of the ARC measure. See Danny Hakim, *To Pay*

Chart 1 illustrates the mean percentage of ARC contributed to 110 state-administered public pension plans between 2001 and 2010.<sup>31</sup> Charts 2, 3, and 4 show the distribution of funding discipline across these plans in 2001, 2005, and 2010.

Chart 1. Mean Percentage of ARC Contributed 2001-2010

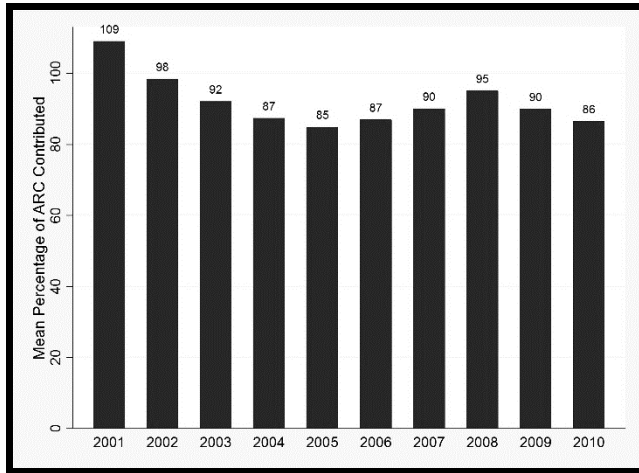
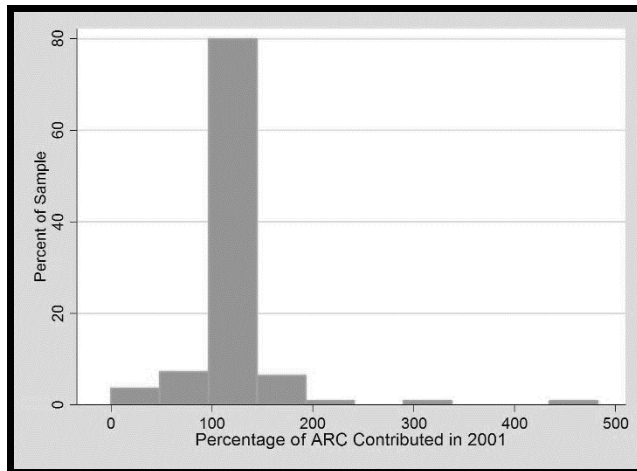


Chart 2. Distribution of ARC Contributions in 2001



*New York Pension Fund, Cities Borrow from It First*, N.Y. TIMES (Feb. 27, 2012), <http://www.nytimes.com/2012/02/28/nyregion/to-pay-new-york-pension-fund-cities-borrow-from-it-first.html>.

31. For a discussion of the data collection techniques, see Part IV.

Chart 3. Distribution of ARC Contributions in 2005

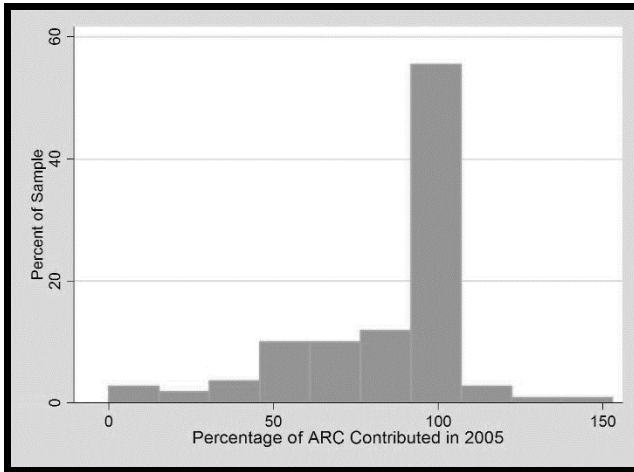
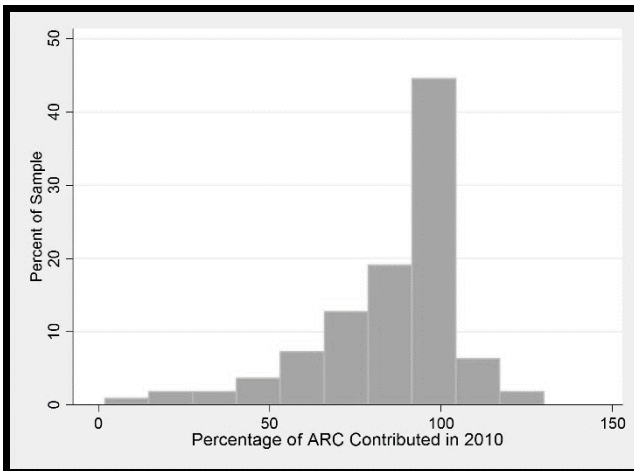


Chart 4. Distribution of ARC Contributions in 2010



These charts reveal that although a sizable portion of the plans receive contributions that meet or exceed the GASB's ARC standards, many do not receive anything close to 100% of the recommended amounts, with some receiving no employer contributions in certain years. The variance is greater in 2010 than in 2005 or 2001, and in the years following the 2008 economic downturn, fewer plans met the GASB benchmarks.

## C. PRIOR SCHOLARSHIP

Scholarship on public pension plans has been growing rapidly. Economists have challenged pension accounting conventions and have identified significant differences in funding patterns across states and plans,<sup>32</sup> while legal scholars have focused on the legal limits of pension reform.<sup>33</sup> Both disciplines have examined the impact of board composition on a variety of outcomes, and especially on investment performance.<sup>34</sup> But the impact of legal institutions on plan-funding discipline has received much less attention. Indeed, the scholarship on funding discipline has been called “embryonic,”<sup>35</sup> and comprehensive studies of public-plan governance provisions in the funding context are “lacking.”<sup>36</sup>

What do we know so far about plan funding? Prior empirical scholarship has identified persistent differences in the “funding practices” or funding “habits” among pension plans.<sup>37</sup> Economists have found that patterns of full funding or underfunding tend to persist from year to year.<sup>38</sup> They have also

32. See *supra* notes 16 & 19 (describing examples of recent scholarship).

33. For analysis of the legal limitations to pension reform, see generally Daniel J. Kaspar, *Defined Benefits, Undefined Costs: Moving Toward a More Transparent Accounting of State Public Employee Pension Plans*, 3 WM. & MARY POL'Y REV. 129 (2011); Amy B. Monahan, *Public Pension Plan Reform: The Legal Framework*, 5 EDUC. FIN. & POL'Y 617 (2010); Amy B. Monahan, *Statutes as Contracts? The “California Rule” and Its Impact on Public Pension Reform*, 97 IOWA L. REV. 1029 (2012); Paul M. Secunda, *Constitutional Contracts Clause Challenges in Public Pension Litigation*, 28 HOFSTRA LAB. & EMP. L.J. 263 (2011); Debra Brubaker Burns, Note, *Too Big to Fail and Too Big to Pay: States, Their Public-Pension Bills, and the Constitution*, 39 HASTINGS CONST. L.Q. 253 (2011); Whitney Cloud, Comment, *State Pension Deficits, the Recession, and a Modern View of the Contracts Clause*, 120 YALE L.J. 2199 (2011); Stuart Buck, *Legal Obstacles to State Pension Reform* (Ass'n for Educ. Fin. & Policy, Working Paper, 2011), available at <http://ssrn.com/abstract=1917563>.

34. See, e.g., Olivia S. Mitchell & Ping-Lung Hsin, *Public Pension Governance and Performance*, in THE ECONOMICS OF PENSIONS: PRINCIPLES, POLICIES, AND INTERNATIONAL EXPERIENCE 92 (Salvador Valedés-Prieto ed., 1997); David Hess, *Protecting and Politicizing Public Pension Fund Assets: Empirical Evidence on the Effects of Governance Structures and Practices*, 39 U.C. DAVIS L. REV. 187 (2005); John R. Nofsinger, *Why Targeted Investing Does Not Make Sense!*, 27 FIN. MGMT. 87 (1998); Roberta Romano, *Public Pension Fund Activism in Corporate Governance Reconsidered*, 93 COLUM. L. REV. 795 (1993); Sylvester J. Schieber, *Political Economy of Public Sector Retirement Plans*, 10 J. PENSION ECON. & FIN. 269 (2011); Michael Useem & Olivia S. Mitchell, *Holder of the Purse Strings: Governance and Performance of Public Retirement Systems*, 81 SOC. SCI. Q. 489 (2000).

35. MUNNELL, *supra* note 6, at 75.

36. Fitzpatrick & Monahan, *supra* note 13, at 4.

37. See Olivia S. Mitchell & Robert S. Smith, *Pension Funding in the Public Sector*, 76 REV. ECON. & STAT. 278, 288 (1994) (finding “wide variations in funding practices” and noting that “pension funding ‘habits’ do seem to persist in the public sector”); see also Tim V. Eaton & John R. Nofsinger, *The Effect of Financial Constraints and Political Pressure on the Management of Public Pension Plans*, 23 J. ACCT. & PUB. POL'Y 161, 186–87 (2004) (finding evidence of persistent funding behaviors); Tongxuan (Stella) Yang & Olivia S. Mitchell, *Public Pension Governance, Funding, and Performance: A Longitudinal Appraisal* 16 (Pension Research Council, Working Paper No. 2005-2, 2005), available at <http://www.pensions-institute.org/workingpapers/WP2005-2.pdf> (finding that “funding patterns are positively correlated over time, confirming the behavioral persistence hypothesis”).

38. See Mitchell & Smith, *supra* note 37, at 282–84.

shown that fiscal stress—as measured by the unemployment rate, for example—has been associated with certain plan sponsors (i.e., the public employers that set up the pension plan) trying to reduce contributions to their pension plans,<sup>39</sup> sometimes indirectly through the manipulation of actuarial assumptions.<sup>40</sup>

But what are the causal mechanisms through which funding “habits” are formed? A survey of the existing literature suggests that control over funding decisions may be one important factor. Policymakers have observed that states vary greatly in the way they organize the funding of their pension plans: some plans have a guaranteed draw on state funds for actuarially determined annual contributions, while others receive only the statutorily set contribution amounts, which may not be updated by the state legislatures for years at a time.<sup>41</sup> More generally, laws in some states are “fundamentally at odds”<sup>42</sup> with the financial requirements of funding pension obligations insofar as they impose constraints on employer contributions that prevent employers from making the full ARC. At least one empirical study so far has shown that “[p]lans with statutory contribution limits are likely to [receive] a smaller percentage of their ARC[s].”<sup>43</sup>

On the other hand, “strong legislation” that takes pension contributions out of the annual political budget appropriation process—for example, by giving the state comptroller the authority to deduct missed payments from

39. *Id.* at 288 (finding that fiscal pressure, as measured by unemployment in a given state, “appears to cause *some* public employers to reduce their annual contributions below required levels” (emphasis added)). Stoycheva finds that in some periods between 2000 and 2009, “fiscal stress influenced pension funding through direct reductions in the contributions to the pension plans versus indirect reductions through manipulation of the discount rate.” Rayna. L. Stoycheva, *Sustainable Governance and Management of Defined Benefit Plans in the Public Sector: Lessons from the Turbulent Decade of 2000–2009*, at 89 (Aug. 11, 2011) (Ph.D. dissertation, Georgia State University), available at [http://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1043&context=pmap\\_diss](http://scholarworks.gsu.edu/cgi/viewcontent.cgi?article=1043&context=pmap_diss); see also Barbara A. Chaney et al., *The Effect of Fiscal Stress and Balanced Budget Requirements on the Funding and Measurement of State Pension Obligations*, 21 J. ACCT. & PUB. POL’Y 287, 296 (2002). *But see* Yang & Mitchell, *supra* note 37, at 17 (finding “no evidence . . . that fiscal distress due to unusually high unemployment rates prompts public employers to underfund their pension promises”).

40. See Chaney et al., *supra* note 39, at 289–306 (finding that fiscally stressed states select discount rate assumptions that reduce funding requirements); see also Eaton & Nofsinger, *supra* note 37, at 163 (showing that “governments” facing tight financial constraints are more likely to reduce pension contributions through the manipulation of actuarial assumptions in a way that reduces required contributions); J. Fred Giertz & Leslie E. Papke, *Public Pension Plans: Myths and Realities for State Budgets*, 60 NAT’L TAX J. 2, 318–21 (2007) (discussing actuarial assumptions in public plans).

41. STATE BUDGET CRISIS TASK FORCE, *supra* note 5, at 15–16.

42. ALICIA H. MUNNELL ET AL., CTR. FOR RET. RESEARCH AT BOS. COLL., WHY DON’T SOME STATES AND LOCALITIES PAY THEIR REQUIRED PENSION CONTRIBUTIONS? 2 (2008), available at [http://ctr.bc.edu/wp-content/uploads/2008/05/slp\\_7-508.pdf](http://ctr.bc.edu/wp-content/uploads/2008/05/slp_7-508.pdf).

43. See ALICIA H. MUNNELL ET AL., CTR. FOR RET. RESEARCH AT BOS. COLL., LOCALLY-ADMINISTERED PENSION PLANS: 2007–2011, at 1, 4 (2013), available at [http://ctr.bc.edu/wp-content/uploads/2013/02/slp\\_29.pdf](http://ctr.bc.edu/wp-content/uploads/2013/02/slp_29.pdf).

state funds due to the delinquent employer—has been associated in case studies with better funding discipline and may explain the striking variation in funding discipline even among plans within the same state.<sup>44</sup> Such anecdotal observations are consistent with the scholarly observation that the decision to fund a state pension plan is subject to the legislative budgeting process in which legislators may decide—often in a bipartisan fashion<sup>45</sup>—to deprioritize funding pension plans that are not facing immediate liquidity constraints. Commitment devices that remove pension funding from the political process and provide an “automatic” draw on state and local resources may also be particularly important in the absence of effective monitoring by relevant stakeholders. Recent scholarship has highlighted the diffuse nature of the harm that results when the costs of pension benefits accrued by current workers are not covered by current workers or taxpayers. Of the constituents primarily affected by underfunding—the participants and the taxpayers—neither group has the incentives to monitor plan funding.<sup>46</sup>

In sum, existing scholarship on pension funding discipline has identified certain funding patterns and has increasingly pointed to the importance of constraints on the short-term preferences of political actors in the

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44. PENG & BOIVIE, *supra* note 23, at 7. Peng and Boivie highlight the success of the Illinois Municipal Retirement Fund (“Illinois MRF”), which, unlike the chronically underfunded Illinois pension plans for state employees and teachers, is well funded as a result of consistent payments of the full ARC amount. According to Peng and Boivie, an “important factor that contributes to Illinois MRF’s strong contribution management is that the state statute governing employer contributions gives the board of trustees broad authority . . . to sue in civil courts to collect delinquent payments from local employers” and also allows the comptroller to “deduct the [delinquent] amounts . . . from any grants of state funds to the municipality.” *Id.* at 21.

45. A recent working paper by political scientists highlights the bipartisan nature of pension politics in “normal” times and shows that from 1999 to 2008, Democrats and Republicans voted together on pension-related bills. Sarah F. Anzia & Terry M. Moe, *The Politics of Pensions* 11–12 (Inst. for Research on Labor & Emp’t, Univ. of Cal. at Berkeley, Working Paper No. 108-14, 2013), available at <http://irle.berkeley.edu/workingpapers/108-14.pdf>.

46. The former group lacks the incentive to monitor because its benefits are fixed; that is, participants do not share directly in the upside of high investment returns or consistent funding, and the most empowered participants are also unlikely to feel the downside of poor funding. Collective bargaining rights have thus not been found to be a significant predictor of funding discipline. See MUNNELL, *supra* note 6, at 8. Taxpayers, on the other hand, are ultimately affected by plan funding and performance, but face information and collective action challenges that prevent effective monitoring. The impact of “funding and investment decisions may not be felt until some point far in the future,” monitoring the board may be costly, and the benefits to any individual taxpayer from this effort are marginal. Fitzpatrick & Monahan, *supra* note 13, at 1330. A third group of constituents—the buyers of municipal debt—has begun, in the wake of municipal bankruptcies, to monitor pension underfunding, but the full scope and impact of its involvement remains to be seen. There is some indication, however, that state credit ratings have motivated pension funding. See, e.g., Michael B. Marois, *Alaska Taps Rainy-Day Cash for Pension Gap: Muni Credit*, BLOOMBERG (July 8, 2014, 7:00 PM), <http://www.bloomberg.com/news/2014-07-09/alaska-taps-rainy-day-cash-for-pension-gap-muni-credit.html> (noting that rating agencies identified Alaska’s pension liabilities as the biggest risk to the state’s credit rating and detailing the state’s subsequent plan to tap its budget-reserve account to pay unfunded pension liabilities).

management of long-term government obligations. The scope and effectiveness of such constraints, however, is not yet well understood.

### III. INSTITUTIONAL VARIATION

Building on the anecdotal evidence and prior studies discussed above, this Part identifies and categorizes previously unexplored institutional differences among pension plans and sets forth the testable hypotheses regarding the impact of the variation on funding discipline. The focus of the categorization is on the variation in control over funding decisions and on the transparency with respect to funding liabilities. Variation in control over funding decisions is present at various points during the funding process and can be thought of as a series of contests for control between the following sets of parties: (1) local vs. state employers, (2) pension system trustees vs. legislatures, (3) delinquent employers vs. pension system trustees, and (4) legislatures and pension system trustees vs. state constitutions. The degree of transparency is a direct function of the liability-sharing terms of the plan, which take one of the three forms described in detail in Part III.B.

#### A. VARIATION IN THE ALLOCATION OF CONTROL OVER FUNDING DECISIONS

##### 1. Local Employers vs. State Employers

Public pension plans vary greatly in the composition of public employers that control and contribute to such plans. Among state-administered plans, some are funded only by municipal and local employers, while others are funded either entirely or at least in part by state-level employers.<sup>47</sup> This Article asks whether separating control over plan administration and plan funding at two different levels of government is associated with improved funding discipline.

The question is motivated in part by prior observations that some public pension plans are like “cookie jar[s] in the household[s] of the state[s].”<sup>48</sup> Anecdotally, there are instances of states withholding contributions from plans funded solely by the state. For example, New Jersey and Connecticut have effectively skipped or made less-than-the-recommended contributions to

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47. See, e.g., CONN. MUN. EMPS. RET. SYS., SUMMARY PLAN DESCRIPTION 3 (2007), available at <http://www.osc.ct.gov/rbsd/cmers/plandoc/MERFSPD7107.pdf> (explaining that municipalities make contributions at rates set by the State Retirement Commission and also contribute toward the administrative costs of the plan); STATE OF CONN., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 73–74 (2011), available at <http://www.osc.ct.gov/2010cafr/CAFR10.pdf> (noting that the state makes the contributions for the state employees plan, as well as the teachers plan, while it does not make any contributions to the municipal employees plan).

48. Chaney et al., *supra* note 39, at 290 (quoting Richard M. Ennis, *Is a Statewide Pension Fund a Person or a Cookie Jar? The Answer Has Implications for Investment Policy*, 44 FIN. ANALYSTS J. 21, 23 (1988)).



their teachers' plans, both of which were funded by the states.<sup>49</sup> In contrast, the Connecticut Municipal Pension Plan, a state-administered plan funded by participating municipal employers, has received all recommended contributions in full over the 2001–2010 decade.<sup>50</sup>

The terms affecting system administration and plan funding are typically set in state statutes. Therefore, in plans comprised of only municipal-level employers, no single municipal employer on its own controls or can change the funding requirements. In such plans, plan funding and plan administration are separated at different “levels” of government: the funding comes from municipal-level employers while the administration and oversight generally take place at the state level (albeit with input from local employers and employees).<sup>51</sup> By comparison, where the state is the sole employer in a state-administered plan, a state legislature faced with large pension contributions can decide to change the funding statutes. The testable hypothesis is that state-administered plans funded solely by local employers are expected to have relatively better funding discipline than plans in which the state functions in both an administrative and an employer (funding) capacity.

## 2. Pension System Trustees vs. State Legislatures

Regardless of the employer composition, pension plans are administered by pension “systems.” Pension systems are generally legally separate organizations with boards of trustees who are charged, as fiduciaries, with the administration of the pension plans.<sup>52</sup> Yet even as legally separate entities,

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49. JAMES CLEMENTE, N.J. DEP'T OF THE TREASURY, DIV. OF PENSIONS & BENEFITS, TEACHERS' PENSION AND ANNUAL REPORT: FISCAL YEAR 2010, at 39 (n.d.), available at <http://www.state.nj.us/treasury/pensions/annrpt2010/tpaf10.pdf> (showing state contributions to the New Jersey Teachers' Pension and Annuity Fund for the 2005–2010 period); JAMES CLEMENTE, N.J. DEP'T OF THE TREASURY, DIV. OF PENSIONS & BENEFITS, TEACHERS' PENSION AND ANNUAL REPORT: FISCAL YEAR 2005, at 37 (n.d.), available at [http://www.state.nj.us/treasury/pensions/annreports\\_2005/tpaf.pdf](http://www.state.nj.us/treasury/pensions/annreports_2005/tpaf.pdf) (showing state contributions to the New Jersey Teachers' Pension and Annuity Fund for the 2001–2005 period); GABRIEL ROEDER SMITH & CO., CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM REPORT ON THE ACTUARIAL VALUATION AS OF JUNE 30, 2006, at E-3, available at [http://www.ct.gov/trb/lib/trb/formsandpubs/actuarial\\_valuation\\_rep\\_2006.pdf](http://www.ct.gov/trb/lib/trb/formsandpubs/actuarial_valuation_rep_2006.pdf) (showing state contributions to the Connecticut State Teachers' plan fell below the ARC during the 2001–2006 period).

50. Based on data assembled by the author. See *infra* Part IV.A; see also STATE OF CONN., *supra* note 47, at 74–75 (noting that “[t]he State acts solely as the administrator and the custodian of the assets of the Connecticut Municipal Employees' Retirement System” and describing the contributions from employees and participating municipalities).

51. See, e.g., CONN. MUN. EMPS. RET. SYS., *supra* note 47, at 1–3 (noting that “[t]he State Retirement Commission is responsible for the administration of the [Connecticut Municipal Employees' Retirement System]” and describing the contributions from the municipalities).

52. In most cases, state governments do not administer pension plans themselves, although, as this Article shows, they often maintain control over certain funding decisions. A few state pension systems are administered by state agencies or departments within state government. In Michigan, for example,

retirement systems are creatures of state statute, and the governor and legislature determine the trustee selection process. The effectiveness of a pension system board as a check on the legislature depends not only on the scope of powers statutorily delegated to the trustees, but also on the trustee selection process and the ultimate composition of the pension system board. The empirical question is whether greater trustee independence and authority promotes better funding discipline.

Trustee selection varies widely across plans. Trustees are either elected by plan participants, appointed by the governor or the legislature, or are holders of public office (such as state treasurer or comptroller) serving *ex officio* (i.e., by virtue of holding the public office position). For some systems, statutory provisions allow the governor to appoint all of the trustees. Other statutory provisions leave the selection of trustees to the system members. Table 1 illustrates the significant differences in trustee composition in a sample of systems. In times of displeasure with the retirement system boards, governors have on occasion tried to replace elected trustees with appointees, as Governor Pete Wilson did in California in the 1990s when he tried to gain control of the California Public Employees' Retirement System ("CalPERS") by proposing to replace the board with political appointees. But such power has not gone unchecked. In California, for example, an initiative measure subsequently led to a constitutional amendment that sets "the number, terms, and method of selection or removal of members of the retirement board," and restricts any further changes to the trustee selection and removal process.<sup>53</sup>

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[t]he Office of Retirement Services ["ORS"] . . . administers four defined benefit pension plans, two defined contribution pension plans, and one defined benefit plus a defined contribution plan with combined net assets of nearly \$50.54 billion . . . ORS is a division of Michigan's Department of Technology, Management and Budget.

About ORS, MICH. OFF. OF RETIREMENT SERVICES, <http://www.michigan.gov/ors/0,4649,7-144-45490-263081-,00.html> (last visited Oct. 31, 2014).

53. CAL. CONST. art. XVI, § 17(f).

Table 1. 2010 Composition of Boards—Examples Selected To Show Variation Across Systems

Plan	Composition of Board
California Public Employees <i>(13 Board members)</i>	<p><b>Six elected members:</b></p> <ul style="list-style-type: none"> <li>• Two members elected by all of the CalPERS members; one elected by all active state members; one elected by and from all active school members; one elected by and from all active local members; and one elected by and from the retired members of CalPERS<sup>54</sup></li> </ul> <p><b>Three appointed members:</b></p> <ul style="list-style-type: none"> <li>• An elected official of a local government and an official of a life insurer; one public representative appointed jointly by the Speaker of the Assembly and the Senate Committee on Rules<sup>55</sup></li> </ul> <p><b>Four ex officio members:</b></p> <ul style="list-style-type: none"> <li>• The State Treasurer; the State Controller; the Director of the Department of Personnel Administration; and a designee of the State Personnel Board<sup>56</sup></li> </ul>
Delaware State Employees <i>(7 Board members)</i>	<p><b>Two ex officio members:</b></p> <ul style="list-style-type: none"> <li>• The Secretary of Finance and the Director of the Office of Management and Budget<sup>57</sup></li> </ul> <p><b>Five appointed members:</b></p> <ul style="list-style-type: none"> <li>• Five members appointed by the Governor with the consent of a majority of the members elected to the Senate. At least two of the appointed members must be affiliated with one of the major political parties, and at least two of the appointed members must be affiliated with the other major political party. Anyone who declines to announce his or her political affiliation is not eligible for appointment as a member of the Board.<sup>58</sup></li> </ul>
Illinois Municipal Retirement <i>(8 Board members)</i>	<p><b>Eight elected members:</b></p> <ul style="list-style-type: none"> <li>• Four trustees must each be a chief executive officer, chief finance officer, or other officer, executive or department head of a participating municipality or participating instrumentality.</li> <li>• Three trustees must each be employees of a participating municipality or participating instrumentality.</li> <li>• One trustee must be an annuitant of the Fund.<sup>59</sup></li> </ul>

54. CAL. GOV'T CODE § 20090 (West 2003) (in effect in 2010).

55. *Id.*

56. *Id.*

57. DEL. CODE ANN. tit. 29, § 8308(e)(1) (Supp. 2008) (in effect in 2010).

58. *Id.* § 8309(e)(2)-(4).

59. 40 ILL. COMP. STAT. 5/7-174 (2008) (in effect in 2010).

The hypothesis is that the presence of ex officio members on the board is expected to be associated with weaker funding discipline because ex officio members necessarily face competing priorities with respect to public funds and may try to use whatever discretion is available to them—through the board or through the legislature—to divert funds away from pension contributions toward other projects and priorities, particularly if such priorities result in outcomes that are more immediately visible and favored by voters. Thus, when compared to the priorities of a board member who is only a public employee or retiree,<sup>60</sup> such competing budgetary priorities are likely to weigh against fully funding the pension plan. Of course, in cases where other institutional features of the plan restrict the authority of the board with respect to the funding decisions, board composition may not have a significant impact.

Indeed, despite the delegation of “administration” to the pension system boards, legislatures generally reserve to themselves certain controls over the pension funding process. The first step in the funding process is the valuation of assets and liabilities. Although in theory a technical exercise performed by an actuary, in practice either the board or the legislature sets the many critical factors—including the discount rate and the amortization period—that boards use in the calculation. Once the actuarial valuation of assets and liabilities is complete, the employee and employer contributions must be set. While the employee contribution rate is almost always fixed in the statute at a certain percent of the employee salary, the setting of the employer rate varies greatly from plan to plan. Table 2 shows examples of the relevant statutory provisions.

The critical distinction is between plans in which the rate is determined by the actuarial valuation and those in which the rate is set in statute by the legislature.<sup>61</sup> In the former case, the actuarial determinations may still be constrained by certain statutory or board-approved parameters and

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60. State government officials are typically themselves members of state pension plans.

61. There are also more granular differences within each category, as both the actuarial approach and the statutory approach can be made more or less aligned with the GASB recommended ARC. For example, in the case of Florida, the statutory contribution rates are frequently adjusted by the legislature to preserve the required amortization period; indeed, Florida Statute Section 121.71 has been amended nearly each year between 2002 and 2010. *See, e.g.*, 2009 Fla. Sess. Law Serv. 2009-76; 2008 Fla. Sess. Law Serv. 2008-139 (West); 2007 Fla. Sess. Law Serv. 2007-84 (West); 2006 Fla. Sess. Law Serv. 2006-35 (West); 2005 Fla. Sess. Law Serv. 2005-93 (West); 2004 Fla. Sess. Law Serv. 2004-293 (West); 2003 Fla. Sess. Law Serv. 2003-206 (West); 2002 Fla. Sess. Law Serv. 2002-402 (West). The case of Alaska Teachers Retirement System (“TRS”), on the other hand, shows the limitations of the provision for actuarial determination. A 2006 audit found that the “TRS board sought to maintain a level, long-term contribution rate of 12 percent for participating employers. Such a strategy resulted in the board often adopting rates lower than the actuarial calculated rates.” PAT DAVIDSON, DEPARTMENTS OF ADMINISTRATION AND REVENUE PUBLIC EMPLOYEES’ RETIREMENT SYSTEM, TEACHERS’ RETIREMENT SYSTEM, AND ALASKA STATE PENSION INVESTMENT BOARD 21 (2006) (citations omitted), *available at* <http://legaudit.akleg.gov/docs/audits/special/combined/300371pt-2006.pdf>.

assumptions, but the contribution rate is nevertheless responsive to fluctuations in the value of plan assets and liabilities. In the latter case, the actual rate or contribution amount may be set in statute or the statute may provide for certain restrictions or caps on employer contributions. Although the statutory language may provide that such statutory rates reflect actuarial valuations and are intended to amortize unfunded liabilities within a certain period, once the statutory rates are set, any changes require legislative action. Thus, statutory rates are necessarily stickier than rates determined annually or semiannually by actuarial valuation.<sup>62</sup>

Table 2. Examples of 2010 Statutory Provisions for the Determination of the Employer Contribution

Pension Plan	Provisions for Determination of Employer Contribution
California Public Employees ( <i>actuarial determination</i> )	<ul style="list-style-type: none"> <li>• Section 20814(a) of the California Government Code provides that with respect to the state's contribution "[t]he Legislature shall adopt the <i>actuary's contribution rates</i> and authorize the appropriation in the Budget Act."<sup>63</sup></li> <li>• Section 20814(b) states that "[t]he employer contribution rates for all other public employers under this system shall be determined on an annual basis by the actuary and shall be effective on the July 1 following notice of a change in rate."<sup>64</sup></li> </ul>
California Teachers ( <i>statutory determination</i> )	<ul style="list-style-type: none"> <li>• Section 22950(a) of the California Education Code provides that "[e]mployers shall contribute monthly to the system <i>8 percent</i> of the creditable compensation upon which members' contributions under this part are based."<sup>65</sup></li> <li>• Section 22951 requires employers to contribute 0.25 percent for retirement benefits accrued from unused sick leave.<sup>66</sup></li> </ul>

62. Administrators of plans with statutorily determined rates often note the need for statutory adjustments to maintain actuarially sound plans. For example, employer contribution rates for the Montana Public Employers Retirement plan are fixed in statute. The 2010 CAFR for Montana PERS, prepared by the board and the actuary, points to the funding challenges of the system since the last statutory rate adjustment:

All systems were actuarially funded within the required 30 years in 2007 and 2008. . . . Effective July 1, 2009, PERS-DBRP and SRS received *the last employer contribution increase under the 2007 Legislative Session House Bill 131*. Based on economic conditions of the past two years and according to the PERB's June 30, 2010 actuarial valuations, the unfunded liability in PERS-DBRP, GWPORS and SRS will not amortize within 30 years.

MONT. PUB. EMP. RET. BD., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 30 (n.d.), *available at* <http://mpera.mt.gov/docs/2010CAFR.pdf> (emphasis added).

63. CAL. GOV'T CODE § 20814(a) (West 2003) (emphasis added) (in effect in 2010).

64. CAL. GOV'T CODE § 20814(b) (West 2003) (emphasis added) (in effect in 2010).

65. CAL. EDU. CODE § 22950(a) (West Supp. 2008) (emphasis added) (in effect in 2010).

66. CAL. EDU. CODE § 22951 (West 2002) (in effect 2010).

	<ul style="list-style-type: none"> <li>• Section 22954 directs appropriation of funds for the Supplemental Benefit.<sup>67</sup></li> <li>• Under Section 22955(a) “a continuous appropriation is hereby annually made from the General Fund . . . for transfer to the Teachers’ Retirement Fund . . . equal to 2.017 percent of the total of the creditable compensation . . . upon which members’ contributions are based.”<sup>68</sup></li> </ul>
Hawaii ERS ( <i>statutory determination</i> )	Section 88-122 of the Hawaii Revised Statutes Annotated provides that “based on regular interest and such mortality and other tables as are adopted by the board of trustees, the actuary engaged by the board, on the basis of successive annual actuarial valuations, shall determine the employer’s normal cost and accrued liability contributions for each fiscal year . . . Commencing with fiscal year 2008–2009 and each subsequent fiscal year until fiscal year 2011–2012, the employer contributions for normal cost and accrued liability . . . shall be based on <i>nineteen and seven-tenths per cent</i> of the member’s compensation for police officers, firefighters, and corrections officers and <i>fifteen per cent</i> of the member’s compensation for all other employees.” <sup>69</sup>
Kentucky ERS ( <i>statutory determination</i> )	Section 61.565(5) (a) of the Kentucky Revised Statute provides that “[i]t is the intent of the General Assembly to begin phasing into the full actuarially required contribution rates.” Sections (5) (b) and (c) delineate annual percentage of the ARC targets for future years requiring, for example, forty-four percent (44%) of the actuarially required contribution for the fiscal year beginning July 1, 2010. <sup>70</sup>
New York State and Local ERS ( <i>actuarial determination</i> )	Section 17(a) of the New York Retirement and Social Security Law provides that each year “the comptroller shall determine the amount which each participating employer is required to pay to the retirement system to discharge its obligations thereto . . . This amount shall consist of the amount deemed necessary to provide for payment in full of (i) all estimated obligations of each participating employer for the current fiscal year of the retirement systems and (ii) any additional obligation, plus interest on such amount, for fiscal years preceding the current fiscal year.” <sup>71</sup>

67. CAL. EDU. CODE § 22954 (Supp. 2010).

68. CAL. EDU. CODE § 22955(a) (Supp. 2014) (in effect in 2010). In 2014, after “[d]ecade[s]-long efforts” to address the \$73.7 billion funding gap, the California legislature approved rate increases for member, employer, and state contributions. *CalSTRS 2014 Funding Plan*, CALSTRS, <http://www.calstrs.com/calstrs-2014-funding-plan> (last visited Oct. 31, 2014).

69. HAW. REV. STAT. ANN. § 88-122(a), (c) (2012) (emphasis added) (in effect in 2010).

70. KY. REV. STAT. ANN. § 61.565(5), (6) (West Supp. 2009) (emphasis added) (in effect in 2010).

71. N.Y. RETIRE. & SOC. SEC. LAW § 17(a) (McKinney Supp. 2004). Article VIII, section 5(D) of the New York State Constitution also provides that “[e]ach such pension or retirement system or fund thereafter shall be maintained on an actuarial reserve basis with current payments to the reserve adequate to provide for all current accruing liabilities.” N.Y. CONST. art. VIII, § 5(D).

Different plans within the same state—and even plans administered by the same system—may have different provisions for setting employer contribution rates. For example, in Kentucky, three state-administered plans have different provisions regarding employer contributions. The employer rates for the Kentucky Teachers Plan are, and have been historically set by statute.<sup>72</sup> Between 2001 and 2010, 90% of ARC was actually contributed. In contrast, the statutory provisions for the County Employees Plan and the general Employees Retirement System plan, both of which are administered by the same system and the same board, have historically provided for actuarially determined employer contribution rates.<sup>73</sup> However, while the ARC rates for county employers were adopted and fully paid by county employers in all but one year between 2001 and 2010, the state has effectively ignored the contribution rates for state employers. In each of the years between 2001 and 2009, the legislature enacted legislation that “notwithstanding” the statutory provision that requires the state as an employer to pay an actuarially determined rate, the state would appropriate a smaller amount to the pension plan.<sup>74</sup> In the 2010 Comprehensive Annual Financial Report (“CAFR”), the director of the Kentucky Retirement System (“KRS”) reported as follows:

KRS has continued an ongoing effort to raise awareness of the impact of reductions to the employer contribution rates. . . . For 12 out of the last 17 years, the State has appropriated less money than requested by the Board of Trustees to adequately fund the annual required contribution (ARC). This underfunding, coupled with increased benefits, unfunded annual cost of living allowances and two major economic recessions in the last decade, has resulted in funding ratios . . . that are dropping to alarmingly low levels.<sup>75</sup>

The Kentucky example shows the extent of plan-by-plan variation and the risks associated with legislative determination of pension contributions. In

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72. See KY. REV. STAT. ANN. § 161.550 (Supp. 2006) (in effect in 2010).

73. Starting in 2010, however, employer contribution rates for the employee retirement system (but not the County Employees Plan) are set in statute. See *id.* § 161.550(6).

74. For example, a legislative research commission note from October 19, 2004, explains that:

2004 (1st Extra Sess.) Ky. Acts ch. 1, sec. 9, provides, ‘Notwithstanding KRS 61.565 [the statutory provision for actuarially determined rates], the employer contribution rate for an entity participating in the Kentucky Employees Retirement System or State Police Retirement System shall be as follows: (1) From July 1, 2004, through June 30, 2005, the contribution rates shall be no more than 5.89 percent for nonhazardous duty employees, 18.84 percent for hazardous duty employees . . . .’

KY. REV. STAT. ANN. § 61.565.

75. KY. RET. SYS., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 2 (2010), available at <https://kyret.ky.gov/Investments%20Annual%20Reports/2010-cafr.pdf>.

contrast, actuarial determination is expected to have a positive effect on funding discipline because calculating employer contributions based on actuarial results is inherently more responsive to the financial status of the plan and thus more aligned with the GASB's ARC benchmark. Actuarial determination is also associated with greater pension board control, which shields plan contributions from political tampering by legislatures, and in particular, from decreases in—or failures to adequately increase—contribution rates in times of fiscal stress. Although statutorily set contribution rates may be adequate when first set, the legislative consensus and coordination needed to make subsequent changes is likely to hinder all rate adjustments, and especially those that increase required contributions.

### 3. Delinquent Employers vs. Pension System Trustees

Once the employer contribution rate is established—whether by statute or by an actuarial valuation—how does the pension system board ensure the contributions are made? Does the availability of certain enforcement mechanisms promote funding discipline?

A public pension board typically cannot force employers to make payments, but as Table 3 shows, statutory provisions for some plans explicitly require participating employers to make the actuarially required contributions. Other state statutes give the pension board or state treasurer the right to impose penalties on delinquent contributions or to withhold such contributions from funds otherwise due to the delinquent contributors, a provision that would appear to be particularly potent with respect to municipalities that receive funds from the state.

The presence of an enforcement mechanism against delinquent contributors is expected to be associated with better funding discipline, as both the mere threat of withholding and actual withholding of funds are likely to promote better funding discipline.<sup>76</sup> However, the impact of this statutory enforcement mechanism is likely to matter only if an individual employer believes that it would actually be used. Furthermore, in certain plans, the actual contribution of funds to the plan may be a formality. For example, for some state agencies, once funds have been allocated by the state for that agency's pension contribution, the agency is very unlikely to not make the actual transfer of the funds.

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76. See *infra* Table 4.



Table 3. Examples of 2010 Statutory Enforcement Provisions

Plan	Relevant Enforcement Provisions
California Public Employees	“Notwithstanding any other provision of law, neither the state, any school employer, nor any contracting agency shall fail or refuse to pay the employers’ contribution required by this chapter or to pay the employers’ contributions required by this chapter within the applicable time limitations.” <sup>77</sup>
California Teachers	“[Should any county superintendent fail] to make payment of any assessment by the board, the Controller shall, upon order of the board, withhold subsequent payments from the State School Fund to the county for deposit in the county school service fund or, upon the request of a county superintendent of schools to the county auditor, he or she shall withhold payments to a school district for deposit in the district general fund until the contributions and report are received in acceptable form in the office of the system and the board directs the Controller to make those payments less the amount of the assessments to the county that would have been paid had no payments been withheld. The Controller shall thereupon pay to the system the amount of the assessments withheld for deposit in the State Treasury to the Teachers’ Retirement Fund.” <sup>78</sup>
Hawaii ERS	With respect to contributions from counties: “[i]f the amount or any portion of the amounts owed is not paid by the county before the dates specified . . . the director of finance shall retain out of the transient accommodations tax money collected a sum equal to the amount or portion thereof not so paid. All the moneys retained and collected by the director of finance shall be deposited in the appropriate fund or funds of the system. The amount of any deficiency in meeting the obligations shall be added to the amount due from the county for the succeeding quarter.” <sup>79</sup>
Kentucky ERS	“[I]f any agency participating in the Kentucky Employees Retirement System which is not an integral part of the executive branch of state government . . . fails to file all contributions and reports on or before the tenth day of the month following the period being reported, interest on the delinquent contributions at the actuarial rate adopted by the board compounded annually, but not less than one thousand dollars (\$1000), shall be added to the amount due the system.” <sup>80</sup>
New York State and Local ERS	“If payment of the full amount . . . is not made by the date required . . . interest . . . shall commence to run against the unpaid balance . . . . The comptroller shall have full power and authority to bring suit in the supreme court against any participating employer to recover any sum, payment of which is not made as herein required. While any such sum shall remain due and unpaid he may refuse to audit any claim for funds due to such employer from the state.” <sup>81</sup>

77. CAL. GOV'T CODE § 20831 (West 2003) (in effect in 2010).

78. CAL. EDUC. CODE § 23007 (Supp. 2014) (in effect in 2010).

79. HAW. REV. STAT. ANN. § 88-126(c) (2012) (in effect in 2010).

80. KY. REV. STAT. ANN. § 61.675(3)(a), (b) (Supp. 2013) (in effect in 2010).

81. N.Y. RETIRE. & SOC. SEC. LAW § 17(d), (e) (McKinney Supp. 2004) (in effect in 2010).

#### 4. State Legislatures and Pension System Trustees vs. Constitutional Amendments

A pension system is relatively powerless if the legislature simply refuses to appropriate funds to the pension plan in a given year or, as in the case of the Kentucky general employees plan discussed above, simply passes legislation to reduce the contributions in a particular year.<sup>82</sup> Although pension system boards and beneficiaries have challenged certain legislative actions, they have had, on the whole, very limited support from state courts. Even in the states that have explicit constitutional provisions providing for the non-impairment of pension benefits,<sup>83</sup> courts have rarely read such benefit protections to require the protection of plan funding.<sup>84</sup>

But what about specific constitutional protections for pension funding? Thirteen state constitutions directly address plan funding and require, for example, that the plans be funded according to “generally accepted actuarial standards” or on an “actuarially sound basis.”<sup>85</sup> Some states like Louisiana provide extremely detailed funding requirements, including amortization periods, in the state constitution.<sup>86</sup> A legislature that fails to fund the retirement system according to the standard may violate the constitutional requirement. The empirical question is whether the presence of such constitutional requirements has been associated with better funding discipline for the affected plans.<sup>87</sup>

82. See *supra* Part III.A.2.

83. See ALASKA CONST. art. 12, § 7; ARIZ. CONST. art. 29 § 1; HAW. CONST. art. XVI, § 2; ILL. CONST. art. XIII, § 5; LA. CONST. art. X, § 29; MICH. CONST. art. IX § 24; N.Y. CONST. art. 5 § 7.

84. For example, in *People ex rel. Illinois Federation of Teachers v. Lindberg*, the court held that the constitutional provision protecting against the impairment of pension benefits did not create a contractual right to enforce a specific level of pension funding and therefore did not preclude the governor from decreasing appropriations to the pension funds. *People ex rel. Ill. Fed’n of Teachers v. Lindberg*, 326 N.E.2d 749, 753 (Ill. 1975). See generally Darryl B. Simko, *Of Public Pensions, State Constitutional Contract Protection, and Fiscal Constraint*, 69 TEMP. L. REV. 1059 (1996).

85. See, e.g., ARIZ. CONST. art. XXIX, § 1 (“Public retirement systems shall be funded with contributions and investment earnings using actuarial methods and assumptions that are consistent with generally accepted actuarial standards.”); MONT. CONST. art. VIII, § 15 (“Public retirement systems shall be funded on an actuarially sound basis.”).

86. LA. CONST. art. X, § 29 (“For public retirement systems whose benefits are guaranteed by this constitution. . . . The legislature shall, in each fiscal year, by law, provide an amount necessary to fund the employer portion of the normal cost . . . [and] provide for the amortization of the unfunded accrued liability existing as of June 30, 1988, which shall be determined in accordance with the method of valuation selected in [article X, section 29(E)(1)] above, by the year 2029, commencing with Fiscal Year 1989–1990. . . . [Such] amounts are . . . hereby guaranteed payable, each fiscal year, to each retirement system covered herein. If, for any fiscal year, the legislature fails to provide these guaranteed payments, upon warrant of the governing authority of the retirement system, following the close of said fiscal year, the state treasurer shall pay the amount guaranteed directly from the state general fund.”).

87. In a 2014 study, Amy Monahan presents a qualitative examination of states with constitutional funding requirements and finds that “having a constitutional funding requirement in place does not guarantee sound funding methodology or funding discipline.” See Amy B.

Since state constitutions are relatively difficult to change and since specific constitutional funding provisions are likely to be enforced by the courts in cases of breach, the existence of such provisions is expected to be associated with better funding discipline. Although the required level of funding “soundness” may vary, such constitutional provisions should serve as pre-commitment mechanisms that limit the control of plan sponsors over funding decisions.

## B. *TRANSPARENCY REGARDING UNFUNDED LIABILITIES*

### 1. Liability Sharing Arrangements

In addition to the differences described in Part III.A, public pension plans also vary in the allocation of liabilities among the participating public employers. Although prior analyses have tended to treat all plans as identical in this regard, it is important to examine whether the variation in the liability structures described below is associated with different funding patterns.

Under GASB rules, a pension plan that provides pensions to the employees of only one employer is classified for financial reporting purposes as a “single-employer” plan (a primary government and its component units are considered to be one employer). A pension plan that provides pensions to the employees of more than one employer is classified as a “multiple-employer” plan. If the assets of a multiple-employer plan are pooled for investment purposes but separate accounts are maintained for each individual employer such that each employer’s share of the pooled assets is legally available to pay the pensions of only its employees, the plan is classified as an “agent multiple-employer” plan. Employers may also pool both their assets and their liabilities in a “cost-sharing multiple-employer” plan. In this arrangement, employers share their obligations to provide pensions to their employees, and plan assets can be used to pay the pensions of the employees of any employer that provides pensions through the plan. While in an agent plan, each employer can offer different pension benefits to its employees through its own asset and liability accounts, no such separate accounts exist in cost-sharing plans, and by joining a cost-sharing plan, an employer loses the independence of designing unique benefits. In the public sector, cost-sharing plans are more common than agent plans, and many state-administered plans include hundreds of local-level employers in addition to the state government employers.

Chart 5 below summarizes the variation in employer liability arrangements. Appendix A offers examples of the liability arrangements in various states.

Chart 5. Public Employer Participation and Liability Arrangements

	Liabilities Pooled	Liabilities Separated (Individual Accounts)
One Employer	Single-Employer Plan	
Multiple Employers	Cost-Sharing Multiple-Employer Plan	Agent Multiple-Employer Plan

2. Disclosure Requirements

For the 2001–2010 period considered in this Article, one set of disclosure obligations applied to employers that participated in single-employer and agent multiple-employer plans, and a different set of obligations applied to employers in cost-sharing multiple-employer plans.<sup>88</sup> For all three types of plans, the plan had to disclose its funding level and the ARC for the reporting year and the six prior years. An employer participating in a single-employer plan or in an agent multiple-employer plan also had to disclose in its own CAFR (separate from the financial report of the plan) the funding level for its individual account. By contrast, an employer in a cost-sharing plan did not have to disclose anything about its obligation for the aggregate unfunded liability of the plan.

Hawaii’s state-administered pension plan illustrates the limitations of the disclosure requirements for cost-sharing plans. The Hawaii Employee Retirement System (ERS) administers a cost-sharing defined benefit plan for employees of “the State of Hawaii, City and County of Honolulu, and the counties of Hawaii, Maui, and Kauai.”<sup>89</sup> This 2009 CAFR for the plan as a whole disclosed that as of June 30, 2009, the ERS plan was 64.6% funded, with over \$6 billion in unfunded pension obligations.<sup>90</sup> Collectively, in 2009, the participating employers, including the state, contributed an amount equal to 109.9% of the ARC.<sup>91</sup>

Even though the pension plan had over \$6 billion in unfunded pension obligations at the end of 2009, neither that \$6 billion figure nor even a

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88. In 2012, GASB adopted significant changes to the reporting requirements. *See infra* Part VI.  
 89. EMPS.’ RET. SYS. OF THE STATE OF HAW., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 5 (2013), available at <http://ers.chawaii.gov/wp-content/uploads/2013/06/CAFR-2010-rev-2.pdf>.  
 90. *Id.* at 66.  
 91. *Id.*

portion of it ever appeared on any state, municipal, or county financial report. Indeed, in the 2009 Hawaii state CAFR, the state disclosed only the state's ARC, and that the state contributed 100% of the ARC in each of the three prior years.<sup>92</sup> What the state did not provide was any information regarding what percentage of the unfunded liability could be attributed to the state employees versus employees of participating cities and counties. In other words, the disclosure requirements for cost-sharing plans shrouded the source of the \$6 billion of underfunding and the allocation of that liability among the numerous participating employers. In contrast, if Hawaii's plan had been an agent multiple-employer plan, the Hawaii state CAFR would have had to provide information about the funding level for just the state's portion. Each participating city and county would have had to do the same with respect to its own account.<sup>93</sup>

The cost-sharing arrangements and the applicable reporting regime under GASB have thus obscured the magnitude of unfunded pension liabilities and shielded such liabilities from the scrutiny of investors lending money to indebted municipalities and states and from the participating employers themselves. Indeed, representatives of cost-sharing plans and the participating employers have argued that participating employers have no legal obligation to make contributions to the plan other than those required by statute, and that employees look solely to the plan, not to the employer, for payment of benefits. They have also stated that in many cases, the law does not clearly address the question of who is liable for the amount of

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92. See EMPS.' RET. SYS. OF THE STATE OF HAW., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2009, at 89 (2012), available at <http://ers.ehawaii.gov/wp-content/uploads/2012/02/CAFR2009rev2.pdf>.

93. For example, the State of Indiana contributes to the Public Employees' Retirement Fund, an agent multiple-employer plan. The 2010 State CAFR discloses that as of July 1, 2009, "the state employees portion of the plan was 87 percent funded. The actuarial accrued liability for benefits was \$2.4 billion, and the actuarial value of assets was \$2.1 billion, resulting in an unfunded actuarial accrued liability (UAAL) of \$0.3 billion." OFFICE OF IND. AUDITOR OF STATE, COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 104 (2011), available at [http://www.in.gov/auditor/files/Entire\\_2010\\_CAFR.pdf](http://www.in.gov/auditor/files/Entire_2010_CAFR.pdf). The plan's CAFR discloses that overall, the plan was 93.1% funded, with .9 billion in total unfunded actuarial accrued liability. IND. PUB. EMPS.' RET. FUND., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 56 (2010), available at <http://www.in.gov/inprs/files/PERFCFR2010.pdf>. Similarly, the 2012 CAFR for Colorado PERA, the administrator of several cost-sharing plans, explicitly acknowledges the relatively limited disclosure obligations imposed on employers in cost-sharing plans, noting that:

[i]f the Division Trust Funds of PERA were single employer plans or an agent multi-employer plan, [the cumulative net pension obligation], allocated to each employer, would need to be reported as a liability on the employers' financial statements. As the employers are part of a cost-sharing multi-employer plan, they . . . only record a liability if they have not paid the statutorily required contribution rate.

COLO. PUB. EMPS.' RET. ASS'N, COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE YEAR ENDED DECEMBER 31, 2012, at 35 (2013), available at <https://www.copera.org/pdf/5/5-20-12.pdf>.

underfunding should plan assets be insufficient to pay liabilities; such a scenario would “undoubtedly generate complex litigation.”<sup>94</sup>

Therefore, relative to the cost-sharing arrangement, both the agent multiple and the single-employer arrangements are expected to be associated with better funding discipline. For each participating employer, the latter has provided a measure of the liabilities and the available assets for the pension benefits of its own employees, thus enabling better planning with respect to future benefits and current uses of employer revenues. Furthermore, as a result of the greater disclosure requirements under GASB guidelines, an employer participating in a single-employer or agent plan (but not in a cost-sharing plan) has had to disclose any unfunded liabilities attributed to that employer to plan participants, taxpayers, and investors. Such greater transparency and ease of monitoring can be expected to promote annual contributions that more closely track the GASB-recommended ARC amounts.

#### IV. EMPIRICAL DESIGN

##### A. DATA

This Article combines 2001–2010 data provided by the Center for Retirement Research at Boston College (“CRR”),<sup>95</sup> with original data collected and coded by the author. The frequently cited CRR Public Plans Dataset (“PPD”) <sup>96</sup> contains certain financial, governance, and plan design information for 126 state and local defined benefit plans.<sup>97</sup> Of those 126 plans, the PPD covers 107 state-administered plans, which represent more than 90% of all state government pension assets and members.<sup>98</sup> The other 19 plans in the PPD are locally administered plans (such as the plan for the city of Austin or the plan for Houston firefighters).<sup>99</sup>

Although many analyses cite averages from all 126 plans in the PPD, this Article distinguishes between state-administered plans and non-state-administered plans (i.e., plans administered by and covering the employees

94. Letter from the Employer Cost-Sharing Coalition to Michelle Czerkawski, GASB (Dec. 27, 2011). The Coalition is “a group of cost-sharing plans and employers including California State Teachers’ Retirement System, the Colorado Public Employees’ Retirement Association, the Kentucky State Teachers’ Retirement System, the Nevada Public Employees’ Retirement System, Ohio Public Employees’ Retirement System, and the University of Colorado.” *Id.*

95. Ctr. for Ret. Research at Bos. Coll., *State and Local Defined Benefit Plans*, PUB. PLANS DATABASE, <http://nianticsystems.com/pls/apex/f?p=1988:20:0::NO:RP> (last visited Oct. 31, 2014) (follow hyperlink for dataset; the CRR dataset downloaded for this Article is on file with the author).

96. *See, e.g.*, GOKHALE, *supra* note 16; U.S. GOV’T ACCOUNTABILITY OFFICE, *supra* note 3, at 2; Robert K. Triest & Bo Zhao, *The Role of Economic, Fiscal, and Financial Shocks in the Evolution of Public Sector Pension Funding* 5 (Fed. Reserve Bank of Bos., Working Paper No. 13-26, 2013), available at <http://www.bostonfed.org/economic/wp/wp2013/wp1326.pdf>.

97. Ctr. for Ret. Research at Bos. Coll., *supra* note 95.

98. *Id.*

99. *Id.*

of a single municipality, county, or special district). As plans administered by individual cities, counties, or special districts are different from plans created by state statute and administered by state-level entities, this Article excludes the 19 locally administered plans in the PPD dataset, as well as the California and Illinois university plans, leaving 105 state-administered plans. A review of each individual plan in the PPD reveals that the 105 state-administered plans include plans covering only state employees, plans covering both state and local employees, and plans covering only local employees. Based on data reported by Peng<sup>100</sup> and on the author's review of state financial reports, data on five additional state-administered plans for local employees is added to the PPD,<sup>101</sup> resulting in a dataset that covers 110 state-administered plans over the ten-year period between 2001 and 2010.

### B. ANALYTICAL APPROACH

The focus of the regression analysis in this Article is on funding discipline, which is approximated by the percentage of the ARC contributed to each plan in a given year. In the panel dataset, the percentage of ARC contributed ranges from 0 to 485.7, with a mean of 92.0 and a standard deviation of 33.44.<sup>102</sup> With the percentage of ARC contributed in each plan-year as the dependent variable, the regression analysis tests the hypotheses associated with each of the independent variables described below. Summary statistics for these variables are presented in Table B2.

**Actuarial Determination:** Based on extensive review of state statutes and state legislation over the 2001–2010 period, the variable “Statute Provides for Actuarial Determination” is hand coded for each plan-year as 1 if the applicable statute provides that the employer contribution is determined by an actuarial valuation and there are no ceilings, caps, or limitations on the contribution. The variable is coded as 0 if the employer contribution rate is set by statute (for example, providing that the employer contribution in a

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100. Peng observes:

With regard to local employee coverage, there are 37 states that offer the same pension plan to both state employees and local employees and the plan is managed by a state-level retirement system. In 12 states where state pension plans do not cover local employees, there is a statewide pension plan or municipal retirement system for just local governments. Massachusetts is the only state that does not have either a state pension plan for local employees or a state-level municipal retirement system.

PENG, *supra* note 10, at 16. Of the systems identified by Peng (and accordingly, the relevant plans administered by each system), all but the following are included in the final dataset used in this Article: Georgia Municipal Employee Benefit System (which provides only administrative support for local plans); Louisiana Municipal Employees Retirement System (for which the relevant data was not available), and the Vermont Municipal Employees Retirement System (for which the relevant data was not available).

101. The five plans are: Connecticut Municipal, Delaware County and Municipal (Police), Delaware County and Municipal (Other), Mississippi Municipal, and Pennsylvania Municipal.

102. One outlier point is excluded as it is likely the result of a coding error.

given year shall equal a set percentage of creditable compensation), or, if there are any caps, limits, or mandatory transfers imposed on actuarial determinations. For example, if the statute provides that the employer contribution shall be determined by an actuarial valuation, but then states that the annual contribution cannot exceed 12% of creditable compensation, the variable “Statute Provides for Actuarial Determination” is coded as 0 for that plan. “Statute Provides for Actuarial Determination” is coded as 1 if the statute provides for actuarial determination, but the legislature in a given year overrides the statute without permanently changing it. Under an alternative specification, the variable “Statute Provides for Actuarial Determination (No Leg. Override),” is coded as 0 in cases where there is a legislative override of the statute in a given year, as though the contribution rate were set by statute in that year. In the plan-year sample analyzed in this Article, the actuarial method is used approximately 58% of the time, or 50% if legislative overrides are treated as “statutory” determinations for a given year.

**Liability Sharing:** A set of dummy variables tracks whether the plan is coded in the PPD as a single-employer plan, an agent multiple-employer plan, or a cost-sharing multiple-employer plan. For purposes of the regression analysis, the variable “Agent or Single-Employer Plan” is coded as 1 for any plan that is an agent multiple-employer or single-employer plan, and as 0 for any cost-sharing multiple-employer plan. Approximately 26% of all plans in the sample are plans that are either single-employer or agent multiple-employer plans.

**Employer Composition:** To measure the impact of employer composition, the variable “Local Employers Only” tracks whether the plan includes the state as an employer. The variable is hand coded by the author as 1 if the state is not an employer and as 0 otherwise. Plans coded as 1 are thus state-administered plans that include only municipal-level employers (i.e., the plan is administered at the state level but no state-level employers participate). Plans coded as 0 include plans comprised of both state and municipal employers and plans comprised of just state employers. Approximately 18% of all plans in the sample are plans in which only municipal-level employers participate.

**Enforcement Provisions:** Based on statutory review by the author, the variable “Statutory Withholding Provision” is coded as 1 if the relevant statutes provide for some means of withholding funds otherwise due to an employer if such an employer fails to make the required contribution to the pension plan. Approximately 34% of the observations in the sample are coded as 1 and all such observations are plans that include municipal employers (i.e., plans where the state is the sole employer tend not to have such enforcement provisions).

**Constitutional Provisions:** The variable “Constitutional Provision for Actuarial Funding” is coded as 1 by the author if the state constitution includes requirements for sound or adequate funding of the state pension



plans. Data is coded based on information initially provided by the National Education Association survey and verified by the author.<sup>103</sup> A total of 26 out of 110 plans are coded as being subject to a constitutional funding provision.

**Board Composition:** Based on a review of relevant statutory provisions and plan reports, the variable “Ex Officio Members on Board” tracks the percent of voting board members who are members by virtue of the political office that they hold (i.e., state treasurer, director of administration, etc.). The median is 16.6% and the 75th percentile is 30.7%. For certain regression specifications, a binary variable is coded as 1 if more than 30% of the voting board members are ex officio members.

In addition to the six institutional variables described above, the regression analysis considers also the impact of fiscal stress and macroeconomics conditions. Fiscal stress is measured by the total state and municipal debt as a percentage of Gross State Product (“GSP”).<sup>104</sup> Prior studies show that fiscal stress is associated with decreases in pension funding,<sup>105</sup> presumably because public employers respond to budgetary pressure by, whenever possible under the particular institutional regime, decreasing contributions to the pension plans. In addition, year-fixed effects are included to take into account the U.S. macroeconomic conditions and trends throughout the 2001–2010 period that broadly affected the asset portfolios of all public pension plans.

The analysis presented below is based on observational data and consequently reflects the limitations of an approach based on such data. While it would be ideal to randomly assign different institutional mechanisms to plans and compare subsequent performance, such an approach is simply not feasible in practice. Since institutions are not randomly assigned to plans, one must consider endogeneity as a possible concern and, specifically, the possibility that the selection of statutory and legal constraints is itself a reflection of a plan sponsor’s commitment (or lack thereof) to funding discipline. In evaluating this potential concern, it is helpful to remember that

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103. NAT’L EDUC. ASS’N, NEA ISSUE BRIEF ON PENSION PROTECTIONS IN STATE CONSTITUTIONS 17–22 (2004), available at <http://www.nea.org/assets/docs/PensionProtectionsInStateConstitutionso4.pdf>.

104. State and local governments increase borrowing as one means of coping with gaps between expenditures and revenues. See, e.g., STEVEN MAGUIRE, CONG. RESEARCH SERV., 7-5700, STATE AND LOCAL GOVERNMENT DEBT: AN ANALYSIS 1 (2011) (noting that state and local governments have used a “combination of rainy day fund withdrawals, tax increases, spending reductions, and in some instances, borrowing to meet these balanced budget requirements”). In this Article, data for this debt variable is calculated using data from the U.S. Census Bureau State & Local Government Finance statistics and the Bureau of Economic Analysis for all but the 2001 and 2003 periods, for which debt data is not available from the U.S. Census Bureau on a state-by-state basis. For those years, estimates are taken from Christopher Chantrell, *Government Spending in the U.S.*, USGOVERNMENTSPENDING.COM, <http://usgovernmentspending.com> (last visited Oct. 31, 2014).

105. See, e.g., MUNNELL ET AL., *supra* note 42, at 4–5; see also Mitchell & Smith, *supra* note 37, at 278, 288.

much of the public pension infrastructure—including the creation of single- and multiple-employer plans, the rate determination methodologies, the withholding provisions, and the inclusion of local employers—was put in place well before the start of the century. Once put in place, the institutional features analyzed in this Article have remained quite constant, particularly over the last decade (and likely over much longer periods). Therefore, each set of decision-makers has generally come into an institutional framework that is itself quite sticky. Under such circumstances, it is reasonable to consider the institutional features discussed above as independent regressors.

## V. RESULTS AND DISCUSSION

### A. RESULTS

The results discussed below provide empirical support for the hypothesis that commitment and transparency promoting institutions play a significant role in pension funding discipline. For a rough cut of the data, Table 4 first sets forth the correlation between the dependent and independent variables. The correlation values between the percentage of ARC contributed and each of the independent variables are consistent with the hypotheses described in Part III.<sup>106</sup>

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106. The correlation matrix reveals that there are positive correlations between certain types of institutional features, which may suggest that certain types of institutions come in packages. See *infra* Table 4. However, tests for multicollinearity using the variance inflation factors confirm that none of the predictors are highly collinear.

Table 4. Correlation Matrix

	Percent of ARC Contributed	Statute Provides for Actuarial Determination	Statute Provides for Actuarial Determination (No Leg. Override)	Agent or Single Employer Plan	Local Employers Only	Const. Provision for Actuarial Funding	Statutory Withholding Provision	Ex Officio Members on Board (over 30%)
<i>Statute Provides for Actuarial Determination</i>	0.15	1.00						
<i>Statute Provides for Actuarial Determination (No Leg. Override)</i>	0.22	0.85	1.00					
<i>Agent or Single Employer Plan</i>	0.12	0.10	0.15	1.00				
<i>Local Employers Only</i>	0.11	0.16	0.19	0.21	1.00			
<i>Const. Provision for Actuarial Funding</i>	0.10	0.08	0.11	0.16	-0.04	1.00		
<i>Statutory Withholding Provision</i>	0.10	0.01	0.07	-0.07	0.11	0.10	1.00	
<i>Ex Officio Members on Board (over 30%)</i>	-0.09	0.20	0.07	-0.04	-0.11	-0.08	-0.11	1.00
<i>Debt as Percentage of GSP in Prior Year</i>	-0.10	0.12	0.02	0.02	-0.02	-0.06	-0.17	0.15

Table 5 presents the core results of the regression analysis. Panel A uses the first specification of “Statute Provides for Actuarial Determination,” which looks only at the statutory language to determine whether or not the employer contribution rate is determined actuarially or is fixed in statute, regardless of any legislative overrides in a particular year that alter the contribution rates without permanently changing the relevant statutory provision. Panel B uses the alternate specification, whereby the employer rate is only coded as being determined actuarially if the statute provides for such determination and if there is no legislative interference in that year.

Table 5. Institutional Features and Plan Funding Discipline 2001–2010

This table presents the results of a series of pooled OLS regressions of institutional variables of interest on plan funding discipline, as measured by the percentage of ARC contributed in a given year. The regressions include year dummies (not shown) and a measure of state and local debt as a percentage of GSP in the year preceding the reporting year. Standard errors are clustered by state and by year. Panels A and B analyze the same variables, with the exception of the variable tracking the statutory provisions for setting the annual employer contribution. Under the coding methodology used in Panel A, a plan is coded as having actuarial determination if the relevant pension statute so provides. The coding methodology used in Panel B incorporates a further search of state statutes and legislation to identify cases where there is a temporary legislative override of the actuarial requirement in a given year. In cases where the legislature overrides an actuarial requirement, the plan is treated as having a statutorily set (rather than actuarially determined) rate for that year.

### Panel A

<i>Dep. Var. = Percent of ARC Contributed</i>						
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Statute Provides Actuarial Determination</b>	10.28** (4.011)	9.676** (3.990)	10.04*** (3.723)	9.924** (3.887)	11.17*** (3.758)	10.51*** (3.410)
<b>Agent or Single-Employer Plan</b>	8.150** (3.940)	7.225* (3.863)	8.680** (3.944)	7.317** (3.721)	7.650** (3.691)	6.753* (3.568)
<b>Local Employers Only</b>		5.402* (2.870)				4.059 (2.995)
<b>Statutory Withholding Provision</b>			6.908 (4.482)			5.497 (4.251)
<b>Const. Provision for Actuarial Funding</b>				5.488* (3.293)		4.675 (3.320)

<b>Ex Officio Members on Board (over 30%)</b>					-8.355 (5.662)	-6.911 (5.365)
<b>Debt as Percentage of GSP in Prior Year</b>	-0.827* (0.467)	-0.802* (0.479)	-0.668 (0.413)	-0.777* (0.459)	-0.699* (0.399)	-0.534 (0.375)
<b>Constant</b>	112.9*** (10.42)	112.2*** (10.60)	108.2*** (9.891)	111.3*** (10.07)	112.5*** (9.582)	106.9*** (9.711)
<b>Observations</b>	1099	1099	1099	1099	1099	1099
<b>R-squared</b>	0.085	0.088	0.094	0.090	0.096	0.108
Standard errors in parentheses; *** p<0.01, ** p<0.05; * p<0.1						

**Panel B**

<i>Dep. Var. = Percent of ARC Contributed</i>						
<b>VARIABLES</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
<b>Statute Provides for Actuarial Determination (No Leg. Override)</b>	13.51*** (4.384)	12.95*** (4.271)	13.02*** (4.085)	13.14*** (4.238)	13.96*** (4.401)	12.73*** (3.949)
<b>Agent or Single-Employer Plan</b>	6.839* (3.517)	6.143* (3.526)	7.374** (3.555)	6.106* (3.449)	6.469* (3.421)	5.777* (3.446)
<b>Local Employers Only</b>		4.348* (2.635)				3.394 (2.728)
<b>Statutory Withholding Provision</b>			6.124 (4.138)			4.939 (4.076)
<b>Const. Provision for Actuarial Funding</b>				5.030* (2.964)		4.396 (3.075)
<b>Ex Officio Members on Board (over 30%)</b>					-6.967 (4.968)	-5.812 (4.874)
<b>Debt as Percentage of GSP in Prior Year</b>	-0.689 (0.420)	-0.676 (0.435)	-0.551 (0.386)	-0.648 (0.417)	-0.564 (0.349)	-0.428 (0.342)
<b>Constant</b>	110.1*** (8.149)	109.6*** (8.479)	106.1*** (8.314)	108.7*** (8.085)	110.0*** (7.552)	105.1*** (8.527)
<b>Observations</b>	1099	1099	1099	1099	1099	1099
<b>R-squared</b>	0.102	0.104	0.109	0.106	0.110	0.120
Standard errors in parentheses; *** p<0.01, ** p<0.05; * p<0.1						

Each set of regression results supports the hypothesis that when it comes to pension funding discipline, institutional constraints matter. Two institutional features are consistently associated with better pension funding discipline. First, actuarial (rather than statutory) determination of employer contribution rates, under either specification of this institutional feature, has a positive and significant impact on pension funding discipline. Second, transparency and accountability—as proxied through plans organized and

accounted for as single-employer or agent multiple-employer plans—is also positively and significantly associated with better pension funding discipline.

Other institutional features—such as the separation of plan funding and plan management, constitutional provisions for actuarial plan funding, and statutory provisions for withholding of funds from delinquent employers—matter as well, and the direction of impact is entirely consistent with the hypotheses in Part III. In the sample used in this analysis, however, the positive coefficients on these variables are not consistently significant at the .10 level. In the case of the constitutional and withholding provisions, the ease of enforcement may be a limiting factor. Recent anecdotal evidence suggests, for example, that constitutional references to “actuarially sound” funding standards do not create sufficiently clear requirements.<sup>107</sup> Further analysis of a larger sample may be necessary to confirm the impact of these institutional features and to tease out their interactions with one another.<sup>108</sup>

As predicted, the impact of greater involvement by ex officio board members is consistently negative, though the coefficient is not statistically significant. The difficulty of quantifying the influence of such members is likely a partial culprit for the lack of statistical significance. First, the power afforded to board members in general varies greatly and, as discussed above, is often constrained by either the actuarial or legislative primacy with respect to funding decisions. Second, a binary cutoff for participation above a certain threshold may not capture the highly context-specific influence of ex officio members. In certain cases, one powerful ex officio member may be able to strongly influence the board, the governor, or the legislature; in other cases, several ex officio members may defer to the preferences of other board members. The use of a continuous measure for the percent of ex officio board members, however, likewise yields a negative but insignificant coefficient. Still, the results demonstrate the need for further investigation of the conflicts of interest that plague ex officio and other appointed board members, and of the potential of fiduciary laws to mitigate such conflicts.<sup>109</sup>

Finally, although the impact of prior year debt-to-GSP ratio is negative, the coefficient is only weakly significant. The coefficients on many of the year dummy variables (with 2001 as the baseline) are negative and significant,

107. See Monahan, *supra* note 87, at 5 (suggesting that “[a] primary weakness in these constitutional funding requirements is that there is no generally accepted standard for funding a pension on an ‘actuarially sound’ basis, and the constitutional language does not define the funding requirement any further”).

108. For example, some of the disciplining effects of the enforcement provisions for state-administered plans with only municipal employers may be picked up by the dummy variable that isolates such plans in order to assess the impact of the separation of funding and management. Notably, in plans that include both the state and local entities as employers, the mean percentage of ARC contributed is 96.00% when there is a withholding provision and 87.75% otherwise.

109. For example, the entire seven-member Retirement Board of the Nevada Public Employees Retirement System is appointed by the governor. NEV. REV. STAT. § 286.120 (2013) (in effect in 2010).

suggesting that year dummies may pick up some of the impact of macroeconomic conditions otherwise picked up by the fiscal stress variable. When year dummy variables are excluded, the coefficients on the debt variable are negative and significant at the traditional thresholds.

*B. CONTROLS AND ROBUSTNESS CHECKS*

The results in this analysis are robust to a number of model and data specifications. With respect to the data, Tables B1, B2, and B3 of Appendix B assess the robustness of the results with respect to particular plans in the sample. First, Tables B1 and B2 consider the impact of removing the five plans in the sample that are considered “closed” to new employees.<sup>110</sup> Although the liabilities for such plans have to be funded in the same way as liabilities for open plans, to the extent that such plans represent more clearly contained and less politically salient liabilities, it is possible that the institutional constraints considered in this analysis affect closed and open plans differently. Table B1 compares the summary statistics for the full sample and for the sample excluding closed plans. Table B2 presents the key analyses shown in Table 5 of this Part, but with a sample that now includes 105 unique plans instead of the 110 in the full sample. The results for the two key institutional variables are generally consistent with the results generated by the full sample, though statistical significance decreases with a smaller sample. Coefficients on the other institutional regressors are directionally consistent with the hypotheses in this Article, but are not consistently significant at the .10 level.

Tables B1 and B3 consider whether the results are robust to plan size. Given the variation in state size and population density, certain plans in the sample are much larger than others. One indicator of approximate plan size is the actuarial value of the assets set aside to fund the plan benefits. Table B1 compares the summary statistics for the full sample and for the sample excluding the smallest and the largest 10% of plans by the actuarial value of the assets. Table B3 presents the key analyses shown in Table 5 but with the value of the assets added as a control, and also using smaller subsamples of either 97 plans (excluding the smallest and largest 10%) or 87 plans (excluding the smallest 25%). Neither adding asset size as a control, nor selecting subsamples based on plan size changes the key findings: the coefficient on actuarial determination of employer contributions remains

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110. The five “closed” plans include: the Alaska Public Employees Plan (after 2005), see STATE OF ALASKA, COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR JULY 1, 2009–JUNE 30, 2010, at 109 (n.d.), available at <http://doa.alaska.gov/dof/reports/resource/fy10/2010cafr.pdf>; Alaska Teachers Plan (after 2005), see *id.* at 110; Mississippi Municipal Retirement Plan, see MISS. CODE ANN. § 21-29-17(d) (1999) (in effect in 2010); Washington Teachers Plan I, see STATE OF WASH., OFFICE OF FIN. MGMT., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 118 (2010), available at <http://www.ofm.wa.gov/cafr/2010/CAFR10.pdf>; Washington Public Employees Plan I, see *id.* at 115; and the Washington Law Enforcement Officers and Fire Fighters Plan I, see *id.* at 122.

positive and statistically significant; the coefficient on the single employer/agent structure remains positive and significant in all but the one specification that analyzes a subsample of 87 plans and includes all of the independent regressors at once. The coefficients on the remaining institutional variables are directionally consistent but not statistically significant at conventional levels.

To ensure that results are not driven by the cases in which annual contributions are either close to zero or exceed 100% of the ARC,<sup>111</sup> Table B4 presents a probit analysis of the model in which the dependent variable is coded as 1 if, in a given year, the contribution to the plan is at least 90% of the ARC benchmark, and as 0 if it is below the 90% threshold. Under this specification, 69% of the observations are coded as 1 and 31% are coded as 0. The results are consistent with the key findings from Table 5. In addition, under this specification, statutory provisions for the withholding of funds from delinquent employers are positively and significantly associated with the likelihood of making a contribution that equals or exceeds 90% of the ARC, suggesting that although this variable may not be associated with small changes in annual contributions, it does have explanatory power in distinguishing plans that receive the bulk of their ARCs and those that do not.

Finally, because funding discipline is measured by the percentage of the GASB recommended ARC contributed in a given year, it is important to consider the limitations of this measure. As noted in Part II, the percentage of ARC contributed is not a perfect measure because GASB has permitted certain variations in the inputs and assumptions used to calculate the ARC, some of which may be strategically selected to decrease the “required” contributions under the GASB guidelines.<sup>112</sup> While it is not feasible to completely standardize each plan’s yearly ARC calculation, it is worth considering whether certain inputs into the ARC calculation are correlated with the institutional variables of interest. For example, do plans that rely on actuarial determination of the employer contribution rate also use longer amortization periods to decrease the required ARC payments—and thus give

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111. A contribution may exceed 100% of the ARC either because statutory provisions mandate contributions in excess of the ARC amount, or because the calculations for the percentage of ARC contributed were based on actuarial data that is more recent than the data used to determine the employer contribution amounts, which, for certain plans, are set several years in advance. GASB, however, requires that financial reports be based on the results of an actuarial valuation that is performed not more than two years before the plan’s reporting date for that year. GOVERNMENTAL ACCOUNTING STANDARDS BD., GOVERNMENTAL ACCOUNTING STANDARDS SERIES: STATEMENT NO. 25, at 15 (1994), *available at* <http://www.gasb.org/jsp/GASB/Page/GASBSectionPage&cid=1176160042391#gasbs25.pdf>.

112. It is worth reiterating that GASB cannot require plan sponsors to actually make any contributions; during the time period analyzed in this Article, its standards merely required the calculation of the “annually required contribution” using a set of parameters set forth in GASB guidelines.



the impression of better funding discipline?<sup>113</sup> Do such plans have longer smoothing periods for purposes of asset valuation so that investment gains and losses are recognized over longer periods?<sup>114</sup>

Table 6 presents an analysis of the correlations between the reported amortization and smoothing periods, and the institutional variables of interest.<sup>115</sup> The results for the amortization period suggest that while certain institutional features appear to be correlated with the amortization period, the correlation is generally negative, such that plans with these features actually use shorter amortization periods.

The results for the smoothing period are more mixed. In the absence of any strict requirements or limitations from GASB, the variety of smoothing techniques complicates direct comparison across plans, and the assessment depends on the coding methodology selected.<sup>116</sup> However, based on either

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113. In considering the amortization period, it is important to distinguish between the amortization period used for purposes of the GASB ARC calculation, which must be less than 30 years after 2006, and the remaining amortization period under the funding policy of any given plan. Indeed, several plans in the sample report at various times that under the funding methodology in effect during the reporting period, the amortization period is much longer than the 30 years permitted by the GASB standards. Other plans report amortization periods that are shorter than the permitted 30 years.

114. Pursuant to GASB Statement 25, GASB has not placed constraints on the kinds of smoothing techniques or the length of smoothing periods used in the actuarial valuation of assets. GOVERNMENTAL ACCOUNTING STANDARDS BD., *supra* note 111. Therefore, different systems calculate the actuarial (rather than the market) value of their plan assets differently. Some systems do not incorporate smoothing techniques and simply take the market value as the actuarial value of assets, while others use fairly straightforward smoothing approaches. For example, the Missouri Public Schools Retirement System uses an asset-smoothing method by which investment returns above or below 8% are recognized over a five-year period. See PUB. SCH. & EDUC. EMP. RET. SYS. OF MO., COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 9 (2010), available at <https://ia600705.us.archive.org/32/items/2010PSRSCAFR/2010PSRSCAFR.pdf>. Other systems use a fixed multi-year smoothing approach but impose a “corridor” that limits the amount by which the market and actuarial values can diverge. See STATE TEACHERS RET. SYS. OF OHIO, COMPREHENSIVE ANNUAL FINANCIAL REPORT: FISCAL YEARS ENDING JUNE 30, 2010, at 15 (2010), available at [https://www.strsoh.org/\\_pdfs/annualreports/cafrs/2010\\_cafr.pdf](https://www.strsoh.org/_pdfs/annualreports/cafrs/2010_cafr.pdf) (“Market changes in investment assets are smoothed over a four-year period for valuation purposes, except that the actuarial value of assets shall not be less than 91% nor more than 109% of market value.”). Still others base the actuarial value on the *expected* rate of return, with an adjustment for market performance. See EMP. RET. SYS. OF TEX., COMPREHENSIVE ANNUAL FINANCIAL REPORT 99 (2012) (“The actuarial value of assets is determined as the expected value of plan assets as of the valuation date plus 20% of the difference between the market-related value and the expected value. The expected value equals the actuarial value of plan assets as of the prior valuation date, plus contributions, less benefit payments and administrative expenses, all accumulated at the assumed rate of interest to the current valuation date.”).

115. Data is taken from the CRR PPD and from plan reports. Amortization period data is available for 992 plan-year data points; smoothing data is available for 1058 plan-year data points.

116. The significant variation in smoothing methods complicates the classification and quantification of such techniques. The CRR database includes a numeric value for the “smoothing period” used by the plans in its sample. This approach, however, may mask certain techniques used by plans to extend the smoothing period. For example, a number of plans that

the CRR methodology or an alternative coding approach,<sup>117</sup> there is some indication that plans with actuarially determined contribution rates use longer smoothing periods—as do plans without state employers, plans with constitutional provisions for actuarial funding, and plans with greater numbers of ex officio board members. However, because longer smoothing periods typically delay the recognition of both investment gains and losses, the net impact of such longer periods on ARC calculations is not simply to reduce the ARC. The task for future research is both to assess the long-term impact of actuarial techniques on funding requirements and to identify the loci of decision-making over actuarial assumptions and methodologies across different plans.

Table 6. Correlation Matrix with Significance Levels

	Amortization Period (GASB)	Smoothing Period (CRR)	Smoothing Period (Alt. Coding)
Statute Provides for Actuarial Determination	-0.26 (0.00)	0.19 (0.00)	0.20 (0.00)
Statute Provides for Actuarial Determination (No Leg. Override)	-0.20 (0.00)	0.09 (0.00)	0.09 (0.00)
Agent or Single-Employer Plan	-0.04 (0.19)	-0.15 (0.00)	0.01 (0.68)
Local Employers Only	-0.08 (0.01)	0.13 (0.00)	0.09 (0.00)
Const. Provision for Actuarial Funding	-0.07 (0.03)	0.08 (0.01)	0.07 (0.03)
Statutory Withholding Provision	-0.00 (0.98)	0.00 (0.93)	-0.13 (0.00)
Ex Officio Members on Board (over 30%)	-0.09 (0.00)	0.25 (0.00)	0.23 (0.00)
Standard errors in parentheses; *** p<0.01, ** p<0.05; * p<0.1			

are coded as having a “1 year” smoothing period employ a technique whereby the actuarial value of assets is determined as the expected value of plan assets plus 20% (or 33% or 10%) of the difference between the market-related value and the expected value. Insofar as only 20% of the difference between the market and the expected value is recognized in one year, this approach may, in effect, extend smoothing beyond one year. Furthermore, systems that choose to recognize 20% of the difference between expected and market value should not necessarily be equated with those that choose to recognize 33% of the difference.

117. For comparison, under an alternative coding scheme, plans that are coded as having a one-year smoothing period in the CRR database but that take the smoothing approach described in *supra* note 114 are coded as having a smoothing period that corresponds to the percentage of the difference between expected and market returns that is recognized in each year. A plan that recognizes 20% of the difference is coded as having a five-year smoothing period.

## VI. POLICY IMPLICATIONS

At a time when retirement security is at the forefront of the national political debate, and public pension reform a major agenda item in most states, this Article highlights the importance of the legal institutions that shape the infrastructure and governance of public pension plans. In contrast to prior research and policy recommendations, the focus is not on pension benefits promised or pension benefits to be taken away.<sup>118</sup> Instead, taking each plan's benefits as a given, this Article shows that certain features of institutional design help ensure that the benefits promised are actually funded. Knowing which institutions have promoted funding discipline in the past should inform the thinking about needed changes and new institutional designs. This Part shows how the findings of this Article offer a new lens through which to view and evaluate the recently enacted GASB reforms,<sup>119</sup> the calls for federal regulation of state and local public pension plans, and the legislative proposals to bring single-employer local plans under state administration.

## A. 2012 GASB REFORMS

In 2012, GASB adopted a series of reforms that represent a major departure from prior practice. In addition to changing how plan liabilities are to be discounted,<sup>120</sup> the new guidelines change the way that each employer's

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118. See, e.g., Jonathan Barry Forman, *Funding Public Pension Plans*, 42 J. MARSHALL L. REV. 837, 870, 871-72 (2009) (stating that "most state and local governments will want to increase the age and service requirements for pension benefits, and many will want to increase employee contributions," and recommending a shift to cash balance plans). In a related vein, the closely watched Detroit bankruptcy, and the proposed reorganization plan, involved scaling back of pension benefits to retirees and current employees. See Alana Semuels, *Detroit Bankruptcy Plan Includes Deep Pension Cuts*, L.A. TIMES (Feb. 22, 2014, 2:00 AM), <http://www.latimes.com/nation/la-na-detroit-bankruptcy-20140222-story.html>. The approved reorganization plan included smaller-than-anticipated cuts to the benefits of retirees due to state and foundation contributions to shore up the pension system. See Monica Davey & Mary Williams Walsh, *Plan to Exit Bankruptcy Is Approved for Detroit*, N.Y. TIMES, Nov. 7, 2014, at A11. Fundamentally, however, municipal bankruptcy can provide some immediate debt relief for a distressed city, but it cannot, by its very nature, impose structural changes or long-term institutional reforms to promote funding discipline. See generally Adam J. Levitin, *Fiscal Federalism and the Limits of Bankruptcy*, in WHEN STATES GO BROKE: THE ORIGINS, CONTEXT, AND SOLUTIONS FOR THE AMERICAN STATES IN FISCAL CRISIS (Peter Conti-Brown & David A. Skeel, Jr. eds., 2012).

119. GOVERNMENTAL ACCOUNTING STANDARDS BD., GOVERNMENTAL ACCOUNTING STANDARDS SERIES: STATEMENT NO. 67 (2012), available at [http://www.gasb.org/jsp/GASB/Document\\_C/GASBDocumentPage?cid=1176160220594&acceptedDisclaimer=true](http://www.gasb.org/jsp/GASB/Document_C/GASBDocumentPage?cid=1176160220594&acceptedDisclaimer=true); GOVERNMENTAL ACCOUNTING STANDARDS BD., GOVERNMENTAL ACCOUNTING STANDARDS SERIES: STATEMENT NO. 68 (2012), available at [http://www.gasb.org/jsp/GASB/Document\\_C/GASBDocumentPage?cid=1176160220621&acceptedDisclaimer=true](http://www.gasb.org/jsp/GASB/Document_C/GASBDocumentPage?cid=1176160220621&acceptedDisclaimer=true).

120. In June 2012, GASB revised its guidance for discounting pension liabilities. Starting with the 2015 fiscal year, the expected rate of return may be applied only to liabilities that will be covered by the plan's net position and projected contributions; for the remaining liabilities, the municipal borrowing rate for a 20-year general obligation bond must be used. See

prior funding history and share of liabilities are to be reported after 2014.<sup>121</sup> The ARC measure is eliminated, and with it, an important benchmark for comparing funding discipline across plans. While GASB took a step in the right direction by requiring all plan sponsors to use the same actuarial cost method for determining annual pension costs, it took a step in the wrong direction by no longer requiring plans to report pension contributions relative to a benchmark measure. Instead, plans will have to report, for a period of the ten most recent fiscal years, either their actuarially determined contribution amount, if applicable, or the statutorily required contribution amount.<sup>122</sup> Those that report an actuarially determined contribution amount will have to provide information about the underlying actuarial assumptions and methods used in the calculation.<sup>123</sup> Notably, plans with statutorily set employer rates will not be required to report actuarially determined contribution amounts for comparison.<sup>124</sup> This change will make future studies of funding discipline far more difficult and will obscure funding discipline in plans whose sponsors make contributions based on statutorily set rates. Though such statutorily set rates could be considered grossly inadequate relative to a 30-year amortization benchmark, the new guidelines no longer require such comparisons. As Alicia Munnell of the Center for Retirement Research has observed, the new rules produce “a tempting escape valve that states could use as ARCs rise beyond reach: introduce a statutory rate and dispense with reporting actuarial calculations.”<sup>125</sup>

While obscuring funding discipline, the new GASB rules should shed light on each employer’s share of a plan’s unfunded liabilities. The new rules limit the masking of liabilities that GASB had previously permitted for cost-sharing multiple-employer plans, whereby significant unfunded liabilities of cost-sharing plans were never attributed to or reported by any of the participating employers. Under the new rules, an employer that participates

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GOVERNMENTAL ACCOUNTING STANDARDS BD., NEW GASB PENSION STATEMENTS TO BRING ABOUT MAJOR IMPROVEMENTS IN FINANCIAL REPORTING (2013), available at [http://www.gasb.org/jsp/GASB/Document\\_C/GASBDocumentPage&cid=1176160140567](http://www.gasb.org/jsp/GASB/Document_C/GASBDocumentPage&cid=1176160140567). For a general discussion of the impact of this change, see, for example, Caitlin Kenney, *Public Pensions Are About to Look Less Healthy*, PLANET MONEY (July 20, 2012, 3:43 AM), <http://www.npr.org/blogs/money/2012/07/20/157060335/public-pensions-are-about-to-look-less-healthy>.

121. GASB Statement 67, “Financial Reporting for Pension Plans”—an amendment of GASB Statement No. 25—is effective for financial statements for fiscal years beginning after June 15, 2013. GOVERNMENTAL ACCOUNTING STANDARDS BD., STATEMENT NO. 67, *supra* note 119, at v. GASB Statement No. 68, “Accounting and Financial Reporting for Pensions”—an amendment of GASB Statement No. 27—is effective for fiscal years beginning after June 15, 2014. GOVERNMENTAL ACCOUNTING STANDARDS BD., STATEMENT NO. 68, *supra* note 119, at ix.

122. GOVERNMENTAL ACCOUNTING STANDARDS BD., STATEMENT NO. 68, *supra* note 119, at v–vi.

123. *Id.* at 98.

124. *Id.* at 164.

125. ALICIA H. MUNNELL ET AL., CTR. FOR RET. RESEARCH AT BOS. COLL., HOW WOULD GASB PROPOSALS AFFECT STATE AND LOCAL PENSION REPORTING? 6–7 (2012), available at [http://ctr.bc.edu/wp-content/uploads/2012/06/wp\\_2012-17-508.pdf](http://ctr.bc.edu/wp-content/uploads/2012/06/wp_2012-17-508.pdf).

in a cost-sharing plan will be required to recognize a liability for its proportionate share of the collective net pension liability. An employer's proportion is to be determined on a basis that "is consistent with the manner in which contributions to the pension plan are determined."<sup>126</sup> GASB encourages "[t]he use of the employer's projected long-term contribution effort as compared to the total projected long-term contribution effort of all employers as the basis for determining an employer's proportion."<sup>127</sup> In addition, each employer's pension liability, regardless of the plan type, will now have to be included on the employer's balance sheet, which should provide a clearer picture of the size of the pension liabilities relative to the resources of the particular public employer.

The results presented in this Article suggest that any requirements that improve transparency and accountability with respect to individual employer liability—as single employer or agent multiple-employer arrangements have done under current GASB rules—can be expected to have a positive effect on funding discipline. However, eliminating the benchmark ARC measure may undermine the positive effect of improved transparency under the new GASB rules. Because the intricacies of pension accounting are not widely accessible, the new GASB rules may create only an illusion of transparency. Huge unfunded liabilities may become easier to see, but the employer's efforts to pay down those liabilities will become much harder to evaluate for taxpayers, investors, and scholars.

#### B. STATE-LEVEL SOLUTIONS

Certain proponents of pension reform have proposed binding federal law—including "ERISA-style" funding requirements on the theory that "[i]f state lawmakers knew that pension promises had to be honored and, more important, had to be funded, they would be less likely to make irresponsible promises."<sup>128</sup> Although the sentiment is certainly apt, binding federal law should not be viewed as the only viable solution to the pension-funding crisis. Not only would a federal solution face strong resistance and constitutional challenges from the states, it would also eliminate the benefits of state-level innovation and regulatory experimentation that is currently taking place. Although ERISA has imposed funding discipline on defined benefit plans, few such plans remain. The effectiveness of ERISA as a long-term solution for

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126. GOVERNMENTAL ACCOUNTING STANDARDS BD., STATEMENT NO. 68, *supra* note 119, at vi.

127. *Id.*

128. See, e.g., Josh Barro, *How Congress Can Help State Pension Reform*, 2012 NAT'L AFF. 92, 102 (2012), available at [http://www.nationalaffairs.com/doclib/20120619\\_Barro\\_indiv.pdf](http://www.nationalaffairs.com/doclib/20120619_Barro_indiv.pdf); see also Roger Lowenstein, *The Long, Sorry Tale of Pension Promises*, WALL ST. J. (Oct. 1, 2013), <http://online.wsj.com/news/articles/SB10001424127887323308504579085220604114220>. ("Before we get more Detroit, or more Studebakers, the federal government should enact an ERISA (with teeth) for public employers.")

funding defined pension plans—rather than as a catalyst for terminating such plans—is not at all clear.

Less drastic changes to state-level institutions may be a more viable option, and indeed various states have already developed innovative institutions to promote funding discipline within the context of their specific public pension arrangements.<sup>129</sup> The focus of such state-level institutional reforms should be on greater independence for pension systems from plan sponsors, particularly with respect to the determination of employer contribution rates and related funding issues. This Article has shown that plan sponsor involvement—whether through legislated employer contribution rates or through control of pension boards—has been associated with poorer funding discipline. By contrast, commitment mechanisms, such as those effected through statutory withholding provisions or constitutional amendments providing for sound actuarial funding of state pension systems, have been associated with better funding discipline and should be considered seriously by concerned legislators and citizens of the states that do not currently have such provisions. In states that do have such provisions, legislative attention should be devoted to the clarity and enforceability of such commitment mechanisms, particularly in light of the elimination of the ARC benchmark.

### C. *STATE ADMINISTRATION OF MUNICIPAL PLANS*

The relative success, as measured by funding discipline, of plans consisting only of local employers has long-term implications for the structure of municipal pensions. Indeed, as noted earlier, the U.S. Census Bureau identifies over 3000 separate pension plans in the United States. The vast majority of these plans are local plans administered by municipalities and special districts. Each local system incurs its own administrative costs, and each misses out on the benefits of the bargaining power enjoyed by larger plans with respect to investments and service providers. More importantly, each municipality is left to both administer and fund the system, often without oversight from state government.<sup>130</sup> Although further empirical analysis is

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129. In Louisiana in 2011, for example, voters approved a constitutional amendment that, in addition to previously adopted constitutional requirements to fund the retirement plans in an actuarially sound manner, requires further that in fiscal years 2013–2014 and 2014–2015, 5% of money designated in the official forecast as nonrecurring be applied toward the balance of the unfunded accrued liability which existed as of June 30, 1988, for the Louisiana State Employees' Retirement System and the Teachers Retirement System of Louisiana. *See* LA. CONST. art. VII, § 10(D), *amended by* 2011 La. Acts 2169 (Act. No. 422), approved Oct. 22, 2011. The newly adopted constitutional provision also requires that in Fiscal Year 2015–2016 and every fiscal year thereafter, 10% of such nonrecurring revenue be applied to such purposes. LA. CONST. art. VII, § 10(D)(2)(b)(iii).

130. States are increasingly concerned about the funding status of independent local plans, and some are looking at means of imposing state oversight on such plans. For example, in Tennessee, The Public Employee Defined Benefit Financial Security Act of 2014 requires local

required, there is at least anecdotal evidence that municipalities that are part of state-administered systems exhibit better funding discipline.<sup>131</sup> Thus, state and local legislators should consider adding municipalities that administer their own plans to existing state-administered agent plans, or creating new systems to administer, on an agent basis, the plans of local employers. As such plans would necessarily be added or modified through state statute, legislators should also consider simultaneously adding withholding provisions to facilitate pension funding discipline among local plans.

## VII. CONCLUSION

The recent focus on public pensions has revealed the serious funding challenges facing many public plans. Recent political solutions have focused largely on benefit cutbacks and increased employee contributions. Yet both the analyses of past performance and the proposed solutions for future reforms have overlooked structural differences among plans. This Article shows that institutions that promote transparency with respect to individual employer liability, limit the discretion of the legislature over pension fund contributions, and hold it accountable for sound funding are associated with

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governments and authorities that are not part of the Tennessee Consolidated Retirement System to meet certain actuarial benchmarks. TENN. CODE ANN. §§ 9-3-501-07 (Supp. 2014). The new law gives the state treasurer the power to withhold governments' share of state revenue if the contributions are not met. *Id.* at 9-3-507(a); Press Release, Tenn. Dep't of the Treasury, Governor Haslam Signs Landmark Local Government Pension Reform Bill into Law (May 28, 2014), available at <http://treasury.tn.gov/PDFs/pension514.pdf>; see also Margaret Newkirk, *Memphis Pension Blues Foretold with Tennessee Bill: Muni Credit*, BLOOMBERG, (Apr. 13, 2014, 7:00 PM), <http://www.bloomberg.com/news/2014-04-14/memphis-pension-blues-foretold-with-tennessee-bill-muni-credit.html> (noting that 13 of the 31 local plans to be subject to the new law "didn't make their full contribution in 2012, . . . [paying] a combined \$86.4 million less than was actuarially required").

131. Although Rhode Island implemented major reforms to its state-administered plans in 2011, state leaders have struggled to bring into line the state's 36 locally administered plans, a few of which have contributed to actual or threatened municipal bankruptcies in Rhode Island. Gina M. Raimondo, Op-Ed, *Next Up: Reforming Local Pension Plans*, PROVIDENCE J. (Dec. 21, 2011), <http://www.treasury.ri.gov/documents/opinion-12-21-11.pdf>. State Treasurer Gina Raimondo wrote that, "Collectively, the locally-administered plans have a reported unfunded liability of approximately \$2.1 billion, and funding level of only 40 percent." *Id.* She encouraged local and state leaders to consider bringing such local plans into the state system, arguing that "[t]his move would provide for uniform benefits across municipalities, pooling of assets managed by the state and a legal requirement for municipalities to make annual required contributions." *Id.* Recent research on locally administered plans suggests, however, that despite negative press about such plans, they are nearly as well funded as state-administered plans. See generally MUNNELL ET AL., *supra* note 43. State-administered plans, however, vary in the nature of the plan sponsors. Some include only state-level employers, while others include both state and local employers. A third type includes only local employers. See *supra* Part III.A.1. For plans that include both state and local employers, the challenge is to allocate any underfunding, as well the funding patterns, among the different plan sponsors. More generally, the critical question is whether plans for local employers that are part of state-administered systems are better funded than similar plans that are administered at the local level, and whether the result is affected by the type of state-administered plans included in the analysis.

more consistent funding of pension promises. Conversely, institutions that obscure liabilities from participating employers, investors, and taxpayers, and that permit the legislature to reduce or skip pension contributions without consequence, are associated with worse funding discipline and unfunded promises. Simply cutting back benefits for employees will not fix U.S. public pension plans. Meaningful long-term reform requires the understanding and evaluation of current pension systems and plans in light of the institutional characteristics highlighted in this Article, and of measures geared toward the disciplined funding of benefits promised to public employees.



## APPENDIX A

Table A. Examples of State Pension Systems and Plans Selected to Show Variation in Design<sup>132</sup>

State	System and Plans	Employees Covered	Employer Participation/ Funding Liability
Hawaii <sup>133</sup>	The Employee Retirement System administers a defined benefit plan.	State employees, teachers, and employees of participating municipal governments	Cost-sharing multiple-employer plan
Massachusetts <sup>134</sup>	The Massachusetts State Employees' Retirement System administers a defined benefit plan.	State employees and employees of certain other public entities	Single-employer plan
	The Massachusetts Teachers' Retirement System administers a defined benefit plan.	Massachusetts teachers and administrators	State is the sole non-employer contributor and hence responsible for all contributions
	Massachusetts does not have a state-administered plan for non-teacher employees of local governments, which explains in part why Massachusetts has over 100 separate pension plans within the state.		
Missouri <sup>135</sup>	The Public School Retirement System administers two plans: Public School Retirement System of Missouri and the Public Education Employee Retirement System.	Public school teachers and non-certificated public school personnel	Each plan is a cost-sharing, multiple-employer plan; the funds of the two plans are managed simultaneously, but each retains title to its own investments and the assets of each plan are restricted for benefits to members of that plan.
	The Missouri State Employees' Retirement	General state employees, legislators,	The SEP and the Judicial Plan are

132. For the number of plans in each state, see BECKER-MEDINA, *supra* note 9, at 34–39 and *Survey of Public Pensions: State- and Locally-Administered Defined Benefit Data*, U.S. Census Bureau, <https://www.census.gov/govs/retire/> (last visited Oct. 31, 2014).

133. See generally STATE OF HAWAII, COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 92 (2010), available at [http://files.hawaii.gov/auditor/Reports/2010\\_Audit/CAFR\\_2010.pdf](http://files.hawaii.gov/auditor/Reports/2010_Audit/CAFR_2010.pdf).

134. See generally MARTIN J. BENISON, STATE OF MASS., OFF. OF THE COMPTROLLER, COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 109 (2011), available at <http://www.mass.gov/osc/docs/reports-audits/cafr/cafr-2010.pdf>.

135. See generally STATE OF MO., OFFICE OF ADMIN. DIV. OF ACCOUNTING, COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR THE FISCAL YEAR ENDED JUNE 30, 2010, at 59 (2011), available at <http://content.oa.mo.gov/sites/default/files/CAFR-2010.pdf>; *About Us*, MO. LOC. GOV. EMP'S RETIREMENT SYS., <http://www.molagers.org/about-us.html> (last visited Oct. 31, 2014).

	System administers a State Employees' Plan (SEP) and a Judicial Plan.	elected officials, and judges	each a single-employer plan.
	The Department of Transportation and Highway Patrol Employees' Retirement System administers a defined benefit plan.	Department of Transportation and Highway Patrol employees	Cost-sharing multiple-employer plan
	The Missouri Local Government Employees' Retirement System administers a defined benefit plan.	Employees of participating political subdivisions	Agent multiple-employer plan
Local governments that do not participate in one of the state-administered plans have individual plans that, together with the state-run plans, comprise Missouri's 66 pension plans.			

## APPENDIX B

Table B1. Comparison of Summary Statistics

	Full Sample		Excluding Closed Plans		Excluding Smallest and Largest 10% of Plans by Actuarial Assets	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
<b>Percent of ARC Contributed</b>	92.00	33.44	92.93	32.75	91.18	36.52
<b>Statute Provides for Actuarial Determination</b>	0.58	0.49	0.58	0.49	0.57	0.50
<b>Statute Provides for Actuarial Determination (No Leg. Override)</b>	0.50	0.50	0.51	0.50	0.48	0.50
<b>Agent or Single-Employer Plan</b>	0.26	0.44	0.25	0.43	0.25	0.43
<b>Local Employers Only</b>	0.18	0.39	0.17	0.38	0.16	0.37
<b>Const. Provision for Actuarial Funding</b>	0.24	0.42	0.24	0.43	0.25	0.43
<b>Statutory Withholding Provision</b>	0.34	0.47	0.35	0.48	0.30	0.46
<b>Ex Officio Members on Board (over 30%)</b>	0.26	0.44	0.23	0.42	0.24	0.42
<b>Debt as Percentage GSP in Prior Year</b>	16.36	3.85	16.25	3.86	16.33	3.89

Table B2. Institutional Features and Plan Funding Discipline 2001–2010,  
Excluding Closed Plans

This table follows the methodology of Table 5 but excludes plans that are closed to new participants. The regressions also include year dummies (not shown) and a measure of state and local debt as a percentage of GSP in the year preceding the reporting year. Standard errors are clustered by state and by year. Models 1–4 use the specification of “Statute Provides for Actuarial Determination” as in Panel A of Table 5; Models 5–8 use the alternate specification described in Panel B of Table 5.

<i>Dep. Var. = Percent of ARC Contributed</i>								
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Statute Provides for Actuarial Determination	12.01*** (3.623)	11.66*** (3.541)	11.71*** (3.323)	11.72*** (3.341)				
Agent or Single-Employer Plan	6.456* (3.344)	5.993* (3.298)	6.983** (3.500)	5.713* (3.367)	5.866* (3.295)	5.456* (3.283)	6.395* (3.465)	5.203 (3.406)
Local Employers Only		2.930 (2.866)		2.137 (3.126)		2.725 (2.677)		2.242 (2.839)
Statutory Withholding Provision			4.841 (4.235)	4.002 (4.191)			4.475 (4.116)	3.689 (4.104)
Const. Provision for Actuarial Funding				4.667 (3.206)				4.889 (3.013)
Ex Officio Members on Board (over 30%)					-3.768 (4.741)			-2.673 (4.374)
Statute Provides for Actuarial Determination (No Leg. Override)					12.03*** (3.940)	11.68*** (3.854)	11.63*** (3.628)	11.27*** (3.462)
Debt as Percentage of GSP in Prior Year	-0.593 (0.373)	-0.583 (0.381)	-0.495 (0.348)	-0.419 (0.336)	-0.455 (0.339)	-0.450 (0.347)	-0.368 (0.327)	-0.304 (0.318)
Constant	108.0*** (7.763)	107.7*** (8.004)	104.9*** (8.353)	103.8*** (8.521)	106.7*** (6.848)	106.5*** (7.104)	103.9*** (7.812)	102.9*** (8.146)
Observations	1039	1039	1039	1039	1039	1039	1039	1039
R-squared	0.084	0.085	0.089	0.096	0.085	0.086	0.089	0.095
Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1								

Table B3. Institutional Features and Plan Funding Discipline 2001–2010,  
Controlling for Plan Size

This table follows the methodology of Table 5 and Table B2 but controls for plan size. As in the other tables, the regressions include year dummies (not shown) and a measure of state and local debt as a percentage of GSP in the year preceding the reporting year. Standard errors are clustered by state and by year. Models 1 and 4 include the full panel sample but add actuarial assets as an independent variable. Models 2 and 5 exclude the smallest 10% and largest 10% of plans by actuarial asset values. Models 3 and 6 exclude the smallest 25% of plans by actuarial asset values.

<i>Dep. Var. = Percent of ARC Contributed</i>						
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Statute Provides for Actuarial Determination	10.86*** (3.349)	11.79*** (3.629)	10.51*** (3.812)			
Agent or Single-Employer Plan	7.421** (3.662)	8.506** (4.183)	10.01** (4.776)	6.296* (3.525)	7.073* (4.137)	8.053 (4.904)
Local Employers Only	3.695 (3.113)	1.882 (3.276)	2.402 (4.493)	3.003 (2.641)	1.483 (2.843)	0.882 (3.549)
Statutory Withholding Provision	5.962 (4.470)	6.196 (5.056)	5.122 (4.533)	5.548 (4.355)	5.763 (4.964)	4.274 (4.359)
Const. Provision for Actuarial Funding	4.033 (3.257)	3.962 (3.720)	3.730 (3.066)	3.818 (2.925)	3.306 (3.175)	3.507 (2.863)
Ex Officio Members on Board (over 30%)	-7.087 (5.663)	-7.544 (6.555)	-4.294 (6.667)	-5.768 (5.121)	-6.057 (5.768)	-3.609 (6.366)
Actuarial Assets	-1.32e-08 (4.81e-08)			-2.10e-08 (4.54e-08)		
Statute Provides for Actuarial Determination (No Leg. Override)				12.94*** (3.760)	14.22*** (3.854)	14.61*** (3.861)
Debt as Percentage of GSP in Prior Year	-0.522 (0.366)	-0.638 (0.400)	-0.834* (0.479)	-0.408 (0.337)	-0.476 (0.367)	-0.694 (0.461)
Constant	106.2*** (9.913)	108.8*** (11.76)	104.0*** (10.77)	104.5*** (8.843)	106.5*** (10.34)	101.3*** (9.952)
Observations	1078	864	809	1078	864	809
R-squared	0.109	0.112	0.132	0.121	0.123	0.158
Standard errors in parentheses; *** p<0.01, ** p<0.05; * p<0.1						

Table B4. Likelihood That Plan Received at Least 90% of ARC

This table presents a series of probit regressions using a binary dependent variable that indicates whether a plan in given year received at least 90% of the ARC benchmark. The regressions also include year dummies (not shown) and a measure of state and local debt as a percentage of GSP in the year preceding the reporting year. Standard errors are clustered by state. Models 1–4 use the specification of “Statute Provides for Actuarial Determination” as in Panel A of Table 5; Models 5–8 use the alternate specification described in Panel B of Table 5.

<i>Binary Dep. Var. = 1 if ARC ≥ 90%, 0 Otherwise</i>								
VARIABLES	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Statute Provides for Actuarial Determination	1.117*** (0.256)	1.088*** (0.260)	1.116*** (0.243)	1.158*** (0.205)				
Agent or Single-Employer Plan	0.716*** (0.238)	0.674*** (0.240)	0.761*** (0.223)	0.673*** (0.222)	0.630*** (0.236)	0.604*** (0.231)	0.664*** (0.215)	0.584*** (0.208)
Local Employers Only		0.301 (0.266)		0.248 (0.293)		0.191 (0.283)		0.158 (0.304)
Const. Provision for Actuarial Funding				0.269 (0.291)				0.292 (0.274)
Statutory Withholding Provision			0.482** (0.242)	0.412* (0.227)			0.425* (0.228)	0.374* (0.222)
Ex Officio Members on Board (over 30%)				-0.341 (0.297)				-0.212 (0.277)
Statute Provides for Actuarial Determination (No Leg. Override)					1.573*** (0.153)	1.553*** (0.157)	1.556*** (0.154)	1.557*** (0.142)
Debt as Percentage of GSP in Prior Year	-0.0649** (0.0295)	-0.0634** (0.0301)	-0.0541* (0.0284)	-0.0458 (0.0279)	-0.0547* (0.0308)	-0.0536* (0.0311)	-0.0441 (0.0302)	-0.0373 (0.0287)
Constant	1.708*** (0.547)	1.667*** (0.559)	1.394*** (0.532)	1.300*** (0.534)	1.583*** (0.577)	1.554*** (0.587)	1.303** (0.579)	1.223** (0.580)
Observations	1099	1099	1099	1099	1099	1099	1099	1099
R-squared	0.209	0.213	0.226	0.241	0.297	0.299	0.310	0.318

Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05; \* p<0.1