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THE BLINKEN REPORT

Strengthening the Security of Public Sector Defined Benefit Plans

January 2014

Donald J. Boyd and Peter J. Kiernan

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Strengthening the Security of Public Sector Defined Benefit Plans

January 2014

Preface

This “Blinken Report” is the first in a series of annual analyses by the Rockefeller Institute of Government of key fiscal issues affecting state and local governments. The Rockefeller Institute has long published reports on state fiscal conditions and the changing financial relationships among national, state, and local governments. Our work is typically descriptive, tracing fiscal developments in states, cities, and the federal system. In some areas, however, we believe we can stick with our neutral, evidence-based approach and offer a careful analysis of major policy problems and what’s known about the merits of policy options. This series combines descriptive and policy analysis.

We launch our series with a study of one of the most challenging fiscal problems confronting subnational governments in the U.S., the financing of pensions for state and local public employees. There has been a lot of press coverage of the Detroit bankruptcy ruling, Illinois’ changes in its public pension benefits, Stockton’s struggles, and other crises involving specific governments. But we wanted to offer a more comprehensive assessment of the issues, one that looked forward to what is needed to strengthen the most common form of public sector retirement benefits, defined benefit plans. We expect Donald Boyd and Peter Kiernan’s analysis will be an essential source for citizens and policymakers who want to understand and deal with the many competing values and uncertainties involved in designing and maintaining public employee pensions.

The two authors are well qualified to write this report. Donald J. Boyd is a senior fellow at the Rockefeller Institute of Government. For over three decades, Boyd has analyzed state and local fiscal issues, and he has written or coauthored many of the Institute’s reports on the changing fiscal conditions of the fifty states. His previous positions include executive director of the State Budget Crisis Task Force, director of the economic and revenue staff for the New York State Division of the Budget, and director of the tax staff for the New York State Assembly Ways and Means Committee. Boyd holds a Ph.D. in managerial economics from Rensselaer Polytechnic Institute.

Peter J. Kiernan practices law at Shiff Hardin in New York City. His practice focuses on public law, public finance, legislative matters, infrastructure development, and government relations. Kiernan has held several high-level posts in state and city government, including chair of the New York State Law Revision Commission, counsel and special counsel to two governors of New York, minority counsel to the New York Senate, and counsel to the deputy mayor for finance in the City of New York. Kiernan received his J.D. and M.B.A. degrees from Cornell University as well as a M.P.A. from the Kennedy School at Harvard.

This series is named in honor of one of the Rockefeller Institute's long-time supporters, Ambassador Donald Blinken of New York City. Donald Blinken's career has ranged widely across investment banking, education, and arts patronage. He cofounded the investment banking/venture capital firm of E.M. Warburg, Pincus & Co. He served as U.S. ambassador to the Republic of Hungary from 1994 to 1998. He was president of the Mark Rothko Foundation and is currently board chair of Columbia University's Blinken European Institute. Don Blinken has also written numerous articles and books, including *Vera and the Ambassador: Escape and Return*, which he coauthored with his wife, Vera.

We at the Rockefeller Institute are most thankful, however, for Don Blinken's role in creating, supporting, and advising the Institute for over three decades. Ambassador Blinken was chair of the Board of Trustees of the State University of New York when the Institute was established in 1982. He and Clifton Wharton, who was Chancellor of SUNY at that time, crafted the Institute's mission and its institutional relationships with SUNY and the State of New York. Since then, Ambassador Blinken has supported our work in fiscal studies, advised us on federalism issues (particularly regarding disaster recovery), and continued to help guide the Institute as a member of our Board of Overseers. This new series of reports promotes a point of view held by Ambassador Blinken, perhaps best expressed by one of his old friends, the late Senator Patrick Moynihan: "Everyone is entitled to his own opinion, but not his own facts." Our aim in the "Blinken Report," this year and in years to come, is to identify the facts in state and local fiscal issues and draw out their many policy ramifications.

One last acknowledgement: All of us here at the Rockefeller Institute owe a great debt to Richard Ravitch — former lieutenant governor of New York, chairman of the New York State Urban Development Corporation, head of the Metropolitan Transportation Authority, and, most recently, cochair (with Paul Volcker) of the State Budget Crisis Task Force. In fact, the research and analysis for this report was begun while Boyd and Kiernan performed work for the Task Force. In this and other ways, the Institute has been privileged to work with Dick Ravitch on state government fiscal issues since 2010. We are deeply grateful to have been part of Dick's intelligent, passionately felt, and indefatigable efforts to make clear to policymakers, journalists, and citizens that state and local government fiscal problems are not only urgent and chronic but also inextricably intertwined with the nation's future.



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Executive Summary

State and local government defined benefit pension systems, which pay benefits to more than eight million people and cover more than fourteen million workers, are deeply troubled. They are underfunded by at least \$2 to 3 trillion using standard economic measures, and by \$1 trillion using measurement practices virtually unique to the public sector pension industry. In response, governments have been raising contributions, cutting services and investments in other areas, raising taxes, cutting benefits for new workers, and even cutting benefits for current workers and retirees.

This is a national concern, affecting retirement security for one-sixth of the workforce, some of whom receive a government public pension in lieu of Social Security coverage, and affecting the capacity of state and local governments to make investments and deliver needed services. We offer this analysis of the problem, and recommendations for correcting the system that allowed this to happen. Public sector defined benefit plans are an important component of the nation's retirement security, and can and should be structured to fund benefits securely.

A Deeply Flawed Funding Approach

Even if painful actions to date were enough to resolve the underfunding – and they are not – the flaws that allowed this underfunding to develop remain in place. It would be a mistake, to leave this situation uncorrected. Underfunding likely would reappear, threatening the ability of state and local governments to keep promises to provide reliable retirement security and to make investments and deliver services at affordable cost.

Bad incentives and inadequate rules allowed public sector pension underfunding to develop. They mask the true costs of pension benefits and encourage underfunding, undercontributing, and excessive risk-taking trapping pension administrators and government funders in potentially destructive myths and misunderstanding. These flaws have existed for decades, but the risks and their potential consequences are much greater now than before.

Inaccurate Financial Reporting

The problem begins with mismeasurement of liabilities and the cost of funding them securely, for financial reporting purposes. The proper way to value future cash flows such as pension benefit payments is with discount rates that reflect the risk of the payments. This is separate from the question of the rate pension funds will earn on their investments.

This bears repeating: The proper rate for valuing pension liabilities on financial statements is separate from the question of what pension funds will earn on their investments. Different rates may be appropriate for valuing liabilities than for assumed investment returns – and we recommend, later, that

different rates be used. The major significance of valuing liabilities incorrectly is that it leads to inadequate funding policies, and encourages the mistaken belief that benefits can be greater, services can be greater, or taxes lower while still funding benefits securely.

Because pensions are promises that should be kept, and have strong legal protections, they should be valued using discount rates that reflect the riskiness of expected benefit payments. Unfortunately, the longstanding practice for public pension plans in the United States, developed before modern financial theory, is to use the expected return on pension fund assets to value liabilities, even though there is no logical connection between how much is owed to workers and what assets will earn. This practice is not used by public pension plans in other countries, or by private plans in the United States, or by economists or financial analysts valuing other cash flows. Our nation's public pension plans stand virtually alone, and recent accounting rule changes by the Governmental Accounting Standards Board (GASB) have not addressed this properly. Rates that reflect the expected risk of benefit payments ordinarily are much lower than the rates public pension funds use to value liabilities, and as a result, public pension liabilities are underestimated by at least \$1-2 trillion, and the annual costs of funding them securely are underestimated by at least \$100-200 billion.

This fundamental flaw cascades through the system.

Underestimated pension liabilities and costs of funding make public pension funds appear artificially healthy and makes the costs of new benefits appear artificially low. This encourages using "surplus" funds to enhance benefits or take contribution holidays. Many governments have done this, even enhancing benefits retroactively, and also cutting contributions, all on the assumption that investment returns can be earned without risk. Because governments almost invariably plan and budget only one or two years ahead, this is very attractive: understating long-term liabilities and the costs of funding them gives the mistaken perception of being able to do more with today's tax dollars, but implicitly pushes risks and, if those risks are not rewarded, costs to the future. The future does arrive.

Incentives to Take Investment Risk

The financial reporting problem is worsened by the link between the earnings assumption and contributions that governments need to make: the higher the assumed earnings, the lower the contributions. This is attractive to governments that sponsor pension funds, and to elected officials, unions, and others, all of whom prefer to use scarce funds for other current purposes, to justify assuming higher investment returns. But to assume higher earnings, pension funds must invest in risky assets, for which actual returns may differ markedly from expected returns. Put differently, they have an incentive to take risk to reach for yield.

Recent research has shown that this is not just a theoretical possibility: Public pension funds respond to the incentive and invest in riskier assets than do public funds in other countries and private funds in the United States, which do not have the same incentive. Public pension funds, which were once staid investors, reliably dependent on high interest fixed rate returns, now have approximately two-thirds of their assets in equity-like investments, including hedge funds and derivatives, which are inherently risky.

All of this might be acceptable if pension funds bore the risk they take. But they do not. Because state and local governments backstop defined benefit plans, ultimately providing higher contributions to make up for any investment shortfalls, the risk is borne by stakeholders in state and local government. If contributions increase, governments will have to cut services such as education, police protection, or care for the needy, or cut investments in roads, clean water, and other infrastructure assets, or else raise taxes, often at times when those affected are least able to bear the consequences. Expenditure cuts can and have led to substantial cuts in workforces and wage growth, often to the detriment of future pension beneficiaries. This “crowd-out” phenomenon has been profound and widespread in recent years. And when required cuts or tax increases go beyond what elected officials are willing to accept, they will cut benefits for new hires and probe legal protections for gaps that allow cuts to expected pensions of current workers and even retirees. This, too, is happening. Thus, stakeholders in government, including current and future workers, retirees, and taxpayers, bear the risk of pension fund investments.

All of this might be acceptable if the risk of large asset shortfalls were small. But it is not. Public pension funds have \$3.2 trillion invested. If they were to fall 10 percent short in a single year — say, losing 2 percent when they expected to gain 8 percent — they would fall \$320 billion short. That’s more than state and local governments spend in a single year on highways, police, and fire protection combined. Some have argued that pension funds are long-term investors and can count on investment risks evening out over the long run. This is simply incorrect and is a myth often put forth uncritically in public pension debates. While the long-run volatility of investment returns does diminish with time, because returns are compounded over time the risk of asset shortfalls actually increases the longer the duration, and assets are what funds must use to pay benefits. Under simplifying but plausible assumptions, a fund invested in assets similar to those of the nation’s largest fund would have a one-sixth chance of falling short by 13 percent after one year. Assuming no increases in contributions, after five years it would have a one-sixth chance of falling 24 percent short, and after thirty years it would have a one-sixth chance of falling 49 percent short. The risk that pension funds will not be able to pay benefits does not diminish with time; it increases. Governments can’t simply ride out the fluctuations in the belief that good returns will balance bad.

All of this also might be acceptable if governments had huge reserves that allowed them to accept volatility in the hope of higher long-run returns than less-volatile investments would offer. But they do not. U.S. governments live hand to mouth. They don't even have reserve funds large enough to allow them to manage the volatility in their tax systems. When contributions must rise, governments that wish to keep retirement benefits secure must cut services or raise taxes. "Crowd-out" is a very real and debilitating phenomenon.

Lax Rules — and Absence of Rules — Allow Underpayment of Contributions

Because the consequences of increasing contributions are so painful, many governments take advantage of the opportunity to minimize and underpay contributions. Some of this is encouraged by actuarial practices that allow very long amortization periods (as much as thirty years) and small initial payments, under which underfunded amounts can actually increase for twenty years or more. Even more insidious are practices allowed by lax rules — and absence of rules — whereby governments simply choose to pay less than actuarially calculated amounts. In 2012 only nineteen states paid at least 100 percent of the actuarially calculated amount. From 2007 through 2011, governments underpaid actuarially calculated contributions to major plans by \$62 billion.

The Risks and Potential Consequences of These Funding Flaws Are Greater Now Than Ever Before

These flawed incentives and inadequate rules have existed for decades, but their risks and potential consequences are much greater now than before. This is because as public pension funds have matured with the aging of the population, their assets and liabilities are much larger relative to the economy than before: assets were 20.4 percent of gross domestic product in 2012, up from 12.6 percent in 1990 and 7.0 percent in 1980. And these assets are far more heavily invested in equity-like assets than before: 66.7 percent in 2012, up from 39.4 percent in 1990 and 22.6 percent in 1980, even as private pension funds have moved in the other direction and now look conservative by comparison. The combination of these two trends means that a 25 percent decline in public pension fund equities, were it to occur, would be nearly three times as great relative to the size of the economy now as in 1990 and more than eight times as great as in 1980. Simply put, the flaws in public pension funding pose much greater risk to governments now than before, relative to their capacity to pay.

Resolving Deeply Underfunded Plans

Some pension systems are so deeply underfunded that they are at the point of crisis. States and localities' tools for resolving these crises are quite limited. States do not have access to the bankruptcy courts. And, while municipalities in about thirty

states can file for protected debt reorganization under Chapter 9 of the U.S. Bankruptcy Code, that is an extreme last resort to which access is limited by uncertainty, reluctance, cost, political pressures, and state laws. While Detroit, Michigan, and San Bernardino, California, are proceeding in Chapter 9 and are being closely watched, most governments will need to resolve underfunding through their own legal and political systems, in the midst of great resistance and uncertainty.

The most important legal considerations for states pursuing pension legislative changes is whether there is a binding, legally enforceable contract between the employer and the employee, and at what point do rights become assured. In more than forty states a pension contract is presumed created by virtue of public service employment, and in at least fifteen of them the contract most likely will be considered operative at time of hire. In these states, even benefits of current workers that have not yet been earned likely are protected from change, and the only substantial reforms heretofore thought possible are those that apply to new hires. This is different than the treatment of private sector benefits under the Employee Retirement Income Security Act (ERISA), which allows changes to benefits not yet earned. Because unfunded liability, by definition, pertains only to current and former workers, changes for new hires cannot reduce unfunded liability. States in which a contract is not deemed to exist or where unaccrued benefits of current employees are not constitutionally or judicially protected have much greater latitude to change benefits.

States and localities in deep distress should determine the “core promise” of a substantial pension, which some analysts have argued is at the heart of legal protection. Under this view, changes outside of the core, such as changes to cost-of-living adjustments and, possibly, retirement age, and employee contribution rates, might be more acceptable to courts than those within the core although such actions might reduce accrued benefits for some. Where a contract does exist, governments may be able to effect changes using their “police power,” although the circumstances in which this is practical appear to be quite limited.

One avenue of change that would affect current employees and retirees may be employing choice as contractual consideration — allowing current employees and retirees to choose to retain their current plans or opt into a new one, such as a defined contribution plan that offers portability, requires greater contributions, or requires employees to share in investment risk. There must be a genuine, rational choice, that, if freely made, courts might determine that there is adequate consideration supporting the contractual modification. In Illinois, where the contract theory of pensions is required by the Illinois constitution, a choice between reduced cost of living adjustments (COLAs) and reduced employee contributions was enacted in early December 2013. A choice to opt into a defined contribution plan also was enacted among other items of contract consideration. Other changes

adopted in Illinois affecting current employees, such as increases in retirement age eligibility depending on years of service and a pensionable salary cap, arguably are noncore adjustments.

Another question is whether it is appropriate to consider pension obligations the equivalent of municipal debt and whether pension debt can be restructured in bankruptcy. In the San Bernardino and Stockton, California, bankruptcy matters, other creditors have asserted that the California Public Employees Retirement System (CalPERS) is a general creditor, just like holders of pension obligation bonds, which were defaulted. CalPERS disagrees, arguing that it is holding deferred employee compensation in trust. In Stockton, the city chose not to include a reduction of pension benefits in the plan of adjustment it submitted to the court. Instead, it chose to reduce health benefits by about 50 percent. In San Bernardino, the issue is unresolved although the city has not made about \$15 million in required payments to CalPERS.

In Detroit, Bankruptcy Judge Steven Rhodes declared Detroit eligible for bankruptcy and also found that "...pension benefits are a contractual right and are not entitled to any heightened protection..."¹ In other words, pension beneficiaries, including retirees and current workers, are general creditors as are general obligation debt holders. Both are subject to impairment. This is notwithstanding that accrued pension benefits are specifically protected under the Michigan Constitution.

One or more of these issues, particularly those related to bankruptcy, ultimately may reach the United States Supreme Court, which has never found there to be a pension contract.

The bottom line is that governments that find themselves in deep distress due to underfunded pensions appear to have quite limited options to reduce already accrued liabilities, although much will depend on how courts interpret provisions now being challenged.

This is all the more reason to fix a system that made it so easy for governments and pension plans to get into this unhappy situation in the first place.

Recommendations

We offer the following recommendations:

- 1. Pension funds and governments should value liabilities and expenses, for financial reporting purposes, using a discount rate that reflects the riskiness of expected benefit payments.** Funds also should disclose projected cash flows used to calculate liabilities so that they can be discounted at alternative rates. Discounting at appropriate rates is likely to result in at least a \$2 trillion increase in reported liabilities for state and local governments in the United States. The estimate of annual pension expense — what governments would have to pay if they were to fully fund pensions without taking investment risk — is likely to increase by more

than \$100 billion. This change would not be a funding requirement; rather, it would be disclosure of pertinent information. This is as it should be: Governments, taxpayers, and others should know the full cost of promises that have been made, and what it could take to fund those promises without risk. A pragmatic variant would be to base the discount rate on a high-quality municipal bond rate. Funds could and would continue to hold some equities and other assets that are not risk free.

2. **Pension funds need to disclose more fully the consequences of the investment.** Pension funds need to disclose the potential consequences of investment risk not only for their funded status, but also for the contributions that participating governments may have to make. The Actuarial Standards Board should develop standards in this area and other professional organizations of actuaries and plan administrators should contribute to this effort.
3. **There needs to be external downward pressure on the current levels of investment risk.** No matter how professional and well-intended pension fund boards are, and no matter how well they disclose investment risks, current and future stakeholders in government will bear the risk that pension funds take. Governments should develop formal statements of the contribution risk that they are willing to bear, and pension funds should consider these statements explicitly as they develop their investment policy statements and asset allocation policies.
4. **Governments should keep their end of the bargain and pay realistic actuarially determined contributions based on realistic assumptions.** State governments have the legal authority to require their local governments to make contributions, and can establish enforcement mechanisms, such as the withholding of state aid, to ensure that they do so. Several states have done so. It is much harder for states to bind their own hands, and impose discipline on themselves. Still, a formal legal commitment to funding required contributions backed with a potential remedy, as New Jersey has adopted and Illinois has proposed, and dedicated revenue sources as several states have provided for local government contributions, hold promise at least to create political pressure for payment of contributions.
5. **The federal government should explore options for ensuring a smoother functioning system of state and local pension plans.** Retirement security is an important national concern, and state and local government

workers account for about a sixth of the national workforce. Furthermore, there is a national interest in much of what states and localities do, whether for federal programs such as Medicaid, or for investments and services that can have benefits that extend beyond state borders, such as infrastructure and education. If these activities are crowded out by sharp and sudden increases in retirement contributions, then the national interest suffers. Thus, there is a potential federal role in encouraging or establishing rules to help address the problems caused by failed state and local pension systems and prevent future failures. The federal government should explore options for regulatory action by the Municipal Securities Rulemaking Board and the Securities and Exchange Commission, and Congressional oversight to enhance reporting and transparency. And if states and standards-setting bodies do not go far enough on their own, the federal government should consider more intrusive action to monitor and police state and local government retirement systems. Congress may wish to employ small carrots and large sticks to encourage transparency in pension fund reporting, disclosure of investment risk, and discipline in pension contributions.

If governments and pension funds follow these recommendations, required pension contributions are likely to rise significantly, depending on the risk tolerance of the governments involved. The sooner governments begin this process, the more time they can take to get on a path toward safer and more secure funding of benefits. This will undoubtedly create pressure to cut services, raise taxes, and even lower benefits. It certainly will create pressure to reduce benefits for new hires. But the alternative is to continue blithely, ignoring risk, simply hoping things turn out well, with great risk of paying much more or, at the municipal level, becoming insolvent.



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THE BLINKEN REPORT

Strengthening the Security of Public Sector Defined Benefit Plans

Donald J. Boyd and Peter J. Kiernan

Introduction

The condition of state and local government pension funding is troubling. The threatened inability of some state and local governments to keep the core promise to their employees to provide reliable retirement security has national significance. State and local government retirement systems cover more than fourteen million workers (about a sixth of the U.S. workforce) and more than eight million beneficiaries.^{2,3} About a quarter of state and local government workers are not covered by Social Security,⁴ and many workers, beneficiaries, and their families rely primarily on their public pensions for retirement security.

In July 2012 the State Budget Crisis Task Force, in its National Report, said that underfunded retirement promises are one of six major fiscal threats faced by state and local governments. It concluded that, "Pension systems and states need to account clearly for the risks they assume and more fully disclose the potential shortfalls they face ... and adopt rules for responsible management of these systems and mechanisms to ensure that required contributions are paid."⁵

Funding of public sector defined benefits, as currently structured, is built on a risky and shaky foundation that makes it likely that future taxpayers and those served by government will pay costs of today's and yesterday's services, and that workers and retirees will not receive full benefits promised for work already performed.

Unhappily, that often is not the case. Public pension systems are opaque and underfunded and many state and local retirement systems are in deep trouble. In aggregate, state and local government pension systems are \$2-4 trillion underfunded when benefits are discounted appropriately, although self-reported underfunding is closer to \$1 trillion.^{6,7} Annual required contributions (ARCs) are rising rapidly, and in many areas are crowding out services.⁸ For the nation as a whole, annual employer contributions increased by \$32 billion between 2006 and 2011, an average rate of 8.3 percent. In many areas the increases have been much more rapid, and further increases may be required.

The funding model for securing pension promises is deeply flawed, with bad incentives, inadequate rules, and little transparency. These flaws mean that even if troubled funds and governments right themselves, and if other funds avoid near-term troubles, the system is likely to continue to face serious problems.

A Deeply Flawed Funding Approach

Current state and local government retirement security programs, almost entirely defined benefit arrangements, create perverse incentives to underestimate pension liabilities and the contributions needed to fund those liabilities; and to reach for yield by investing in risky assets in the hope of minimizing contributions.

The systems rarely impose discipline on governments, which can evade or avoid paying the full required contributions calculated by actuaries – and even those amounts are lower than what is needed for secure funding, making them vulnerable to severe economic downturns.

All of this is done in a figurative dark room: valuing, reporting, and disclosing of pension obligations is confusing, and not comparable from plan to plan. Governments that focus on the short term when they prepare their budgets, planning only one or two years ahead, nonetheless promise benefits that can extend fifty years or more in the future, often protected by statutes and constitutions that sharply constrain permissible changes.

While bad incentives and inadequate rules governing public pensions have been around for decades, the risk they pose is greater now than ever.

Funding of public sector defined benefits, as currently structured, is built on a risky and shaky foundation that makes it likely that future taxpayers and those served by government will pay costs of today's and yesterday's services, and that workers and retirees will not receive full benefits promised for work already performed.

Pension Liabilities Are Mismeasured for Financial Reporting Purposes and Are Usually Understated

Pension *liabilities* are what governments owe to workers and retirees, and the annual cost of new benefits is the value of new

benefits earned in a year. These amounts, and forecasts of what they might be under different policies, are crucial to any government's decision-making. Governments need good information to make good decisions but governments and their pension funds are generating misleading information.

Future Cash Flows Should be Valued Using a Discount Rate That Reflects Riskiness of the Payments

Pension liabilities are not bought and sold on public markets. They must be estimated based on the benefits expected to be paid – i.e., future cash flows. Financial economists and analysts ordinarily value future cash flows using a discount rate that reflects the riskiness of the payments.⁹ This is true whether the payments are mortgage payments on a house, lease payments on machinery, or regular payments from the government. This is a tenet of modern finance.¹⁰ Amounts that are extremely likely to be paid will have lower risk, and therefore a lower discount rate, than amounts that are less likely to be paid – just as lenders charge more to risky borrowers than to creditworthy ones. And the higher the discount rate, the lower the estimated liability. If the government has a firm commitment to pay you \$1,000 in fifteen years, you will use a lower discount rate to determine the value of that promise today than if your shiftless brother-in-law promises to pay you the same amount. The former, if discounted at a 3 percent rate, would be worth about \$642 today, while the latter, discounted at 8 percent, would be worth about \$315 – less than half as much.¹¹ This makes sense – if you could sell the right to receive these payments, purchasers would gladly pay more for the right to receive a guaranteed payment from the government than to receive an uncertain payment from your brother-in-law.

Because pension benefits have strong legal protections in most states, many observers believe the risk that pensions will not be paid is low, although recent marginal pension changes have made it clear that benefits sometimes can be reduced and often have to be. Financial economists are in near unanimity that an approximately risk-free rate should be used to discount public pension liabilities for financial reporting purposes.¹²

Pension Liabilities Are Valued Using an Earnings Assumption, and Thus Are Mismeasured

There is just one exception to the general practice of discounting payments using rates that reflect their risk: public pensions.

Accounting standards for pensions are developed by the Governmental Accounting Standards Board (GASB). GASB set out its current standards, soon to change (as described below), in 1994.¹³ Those standards rely heavily on actuarial methods developed decades earlier for purposes of funding pensions, not for financial reporting. Those actuarial methods were developed before modern finance theory, in a time when pension funds were invested primarily in highly secure bonds with higher interest rates than in

recent years.¹⁴ Significantly, the GASB standards sanctioned very long amortization periods.

Although current public plan actuarial funding methods are said to calculate liabilities, in essence they ask a different question: What assets would we need today to pay benefits when due, assuming the assets can be counted upon to earn a particular rate?¹⁵ This is an important calculation, but **it is not the same as valuing the liability**. It determines required assets by assuming an expected long run rate of return for its investments, and uses this rate to discount projected benefit payments. While it labels the result an “actuarial liability,” in practice it is the amount of assets that would be required to pay future benefits, *if* those assets could be counted on to earn the assumed return by the time benefits must be paid. The higher the assumption, the lower the annual required contribution, and the greater the risk that actual returns will fall short of assumed returns, requiring higher contributions in the future.

A bit of reflection makes clear that discounting by an earnings assumption does not generate a measure of liability: If a pension fund expects to invest in a portfolio of risky assets, it is likely to have a higher expected return than if it invests in a conservative portfolio, and that will reduce the reported liability. No other liability works this way — a homeowner cannot reduce the amount of his or her mortgage debt simply by investing available cash in risky assets with a high expected rate of return.¹⁶ Basing the estimate of liability on what a portfolio might earn can result in poor funding policy.

The use of an earnings assumption to discount liabilities has been called “one of the weirdest emanations of the human mind. It’s a metaphor — like saying that the advent of jet planes made the Atlantic narrower — and metaphor has limited place in finance.”¹⁷

In the early days of low-flying finance when pension funding methods were developed, the failure to value liabilities with a discount rate reflecting their risk did not make a great deal of difference: Pension funds had lower-risk portfolios more in line with the nearly risk-free character of their liabilities, and so the earnings assumption likely was relatively close to an appropriate discount rate. But since then pension funds have increased their investments in risky assets dramatically: In 2012, approximately two-thirds of assets were in other than fixed-income investments.¹⁸ (See Figure 3 on page 23.) Risky assets carry a risk premium — the expected return is higher than on less volatile assets, and so the mismatch between liabilities valued with a risk-free discount rate and liabilities valued using the earnings assumption is huge.

This is the first major flaw: The higher the investment earnings assumption, the lower the reported liability, despite the fact that there is no logical connection between the two.

Underestimated liabilities make pension funds appear healthier than they truly are. Even a plan that appears fully funded when the earnings assumption is used for discounting will be revealed to be underfunded when a lower discount rate is used, because liabilities will be higher.

New GASB Financial Reporting Rules Leave the Discount-Rate Problem Largely in Place

In June 2012, the GASB overhauled pension and accounting standards for governments, effective generally for fiscal years ending June 30, 2015 and later. The new standards make many changes, including to discount rates used for financial reporting. The standards are complex but will have the effect of requiring lower discount rates only for deeply underfunded plans. These deeply underfunded plans will see reported liabilities rise, moving their officially reported liabilities closer to economic reality. Better-funded plans will be unaffected by the change even though their liabilities, too, generally are understated under current practices.¹⁹

One indication that this new approach falls far short of what is required is evident in the response by the rating agency, Moody's Investors Service. Because reported liabilities, even after these changes, will not represent liabilities accurately, Moody's has developed its own adjustments to reported liabilities. It noted that flexibility allowed in the accounting standards then and still in effect had "resulted in inconsistency in actuarial methods and variability in assumptions across plans." It noted that even after the new standards go into effect, "we believe differences in some key financial assumptions such as determination of investment rates of return and discount rates will persist."²⁰

There are many good things about the new GASB standards — they make clear that pension accounting should not determine pension funding, and they ensure that liabilities as defined by the GASB will be more prominent in financial statements — but on the key question of the discount rate, the standards fail. Most plans still will discount liabilities using an earnings assumption, but others will not, making the fiscal health of pension funds even more confusing than it is now.²¹

Underestimated Liabilities and Expenses Make Pension Funds Appear Artificially Healthy and Encourage Using "Surplus" Funds for Benefits or Contribution Holidays

Underestimated liabilities make pension funds appear healthier than they truly are. Even a plan that appears fully funded when the earnings assumption is used for discounting will be revealed to be underfunded when a lower discount rate is used, because liabilities will be higher. For example, in the current Detroit insolvency negotiations, the emergency manager adjusted that city's pension underfunding to \$3.5 billion from the \$600 million that had been reported by the fund.²²

This creates a temptation to enhance pension benefits, or reduce contributions that otherwise should be made. Between 1995 and 2000 the stock market tripled and, partly as a result, state and local pension funds experienced dramatic increases in their funding ratios. Many reported actuarial surpluses that were used to justify benefit increases.²³

California adopted major retroactive benefit increases in 1999 and 2000 — a contributing cause to its current pension difficulties, as discussed in detail in the Task Force’s initial report. At the time, CalPERS appeared well funded, with a reported actuarial funded ratio of 128 percent. Its board argued that retroactive benefit increases would not require contribution increases. But in fact CalPERS was underfunded: If its liabilities had been valued using a risk-free rate, its funded ratio would have been below 100 percent.²⁴ As one former California legislator described incentives to vote for retroactive benefit increases, legislators “could get credit from the unions now and the bill wouldn’t come due until after they were gone.”²⁵

The California increase was notorious because it was large and retroactive, but there were many other increases. In 2001, Delaware improved benefits for active and retired members “to reduce the overfunded position in the State Employees’ Pension Plan by granting benefit improvements to active and retired members...”²⁶ Between 1999 and 2001, twenty-six states enhanced benefits for educators.²⁷ In 2006, Maryland increased the benefit accrual for teachers by nearly 30 percent, retroactive to 1998.²⁸ Researchers estimated that between 1982 and 2006 the generosity of public plans was increased by about 10 percent for career employees.²⁹ Judging by data for the United States as a whole, most systems likely were underfunded even at the top of the bull market in 2001, even though earnings-assumption discounting suggested that, on average, plans were fully funded and long amortization periods gave a sense of false comfort to those plans that evidenced some underfunding.

While it is impossible to know whether the benefit increases would have been granted if liabilities had been reported accurately, overstating plan health may have contributed to increases that later appeared unaffordable. Discount rates can cut in two directions: Alicia Munnell of the Center for Retirement Research at Boston College points out in her recent book that there have been periods in which earnings-assumption discounting overstated liabilities and that if liabilities had been more accurately reported governments might have been less inclined to make pension funding progress.³⁰ While the incentives certainly cut in both directions, accurate information should be the goal.

When liabilities are understated, annual pension costs are understated as well. (With total liability understated, the portion attributed to the current year will be understated. In addition, unfunded liabilities that must be amortized, if any, will be understated.) If understated estimates of pension costs are used when governments decide, by statute or through collective bargaining, on the level of benefits that is affordable, they will overestimate what they can afford.³¹

Public Pension Funding Standards and Practices Encourage Reaching for Yield to Keep Near-Term Contributions Low

Governments should prefund pensions by setting aside funds annually as benefits are earned, so that assets will be available to pay benefits as they become payable. This helps establish intergenerational equity, ensuring that current taxpayers pay for services they receive, rather than passing the cost of those services to the future. Prefunding also helps secure future benefits by ensuring that funds are available, and beneficiaries do not have to rely solely on legal protection and the willingness of governments to pay benefits when due.

Pension funding requires: (1) forecasting future benefit payments; (2) estimating the present value of these payments by “discounting” them to the present; (3) allocating a portion of that value to past service, a portion to the current year, and a portion to future service; and (3) funding the expected benefits through a combination of contributions and investment earnings designed to ensure that money is available when needed to pay benefits.

This is where the distinction between a risk-free discount rate used to value liabilities and the expected earnings rate on pension fund assets becomes important. If pension funds invest in assets that have some risk, they are likely, on average, to receive some compensation for that risk. The expected return on assets will be above the risk free rate. This will permit them to have lower assets and contributions than the risk-free rate, but at a risk: that the plan will accrue future unfunded liabilities and will require future contribution increases, passing current costs to future generations.

This intergenerational inequity can be avoided by investing in risk-free assets of similar duration to the liabilities, but that would require MUCH larger employer contributions than now. The important questions become, how much risk of future underfunding and future contribution increases should pension plans take, and how are those risks managed and disclosed? A corollary question is how much risk is acceptable as public policy?

Governments generally appear to prefer to report lower liabilities and to make lower contributions to pension funds: the more that is contributed to pension funds, the less that is available for other current purposes. This is fiscal imprudence abetted by unrealistic long amortization periods for pension liabilities that are consistent with actuarial standards of practice published by the Actuarial Standards Board and that are allowed under GASB reporting standards. Other stakeholders appear to prefer this as well, for the same reasons. For example, unions have opposed efforts to base discount rates on risk-free or low-risk rates.³² Even retirement system administrators and boards, which can have healthier pension funds when discount rates are proper, have expressed concern about how lower discount rates and higher contributions might affect the fiscal health of governments that contribute to their funds

notwithstanding the intergenerational wealth transfer that may result.³³

Higher assumed earnings rates lower governmental contributions in the short term in two ways: First, the higher the assumed investment return, the lower the reported liability, and the lower the unfunded liabilities that must be amortized. Second, the higher the assumed investment return, the lower the present value of pension benefits allocated to the current year. If funds invest in riskier assets, higher expected returns are plausible, and therefore contributions can be lower (as well as reported liabilities).

These effects are large: When Moody's revalued pension liabilities for major systems in April 2013, it revised upward the estimated liabilities for the universe it covers by \$1.9 trillion. It estimated that if governments were to amortize the adjusted net pension liability over twenty years, governments would have to make additional annual contributions of approximately \$90 billion.³⁴ (Moody's was not making a funding recommendation. This was simply its estimate of what might occur if governments amortized the higher liability.) There are no ready estimates of how much contributions would have to increase if normal costs were discounted properly but, in a 2012 analysis, Moody's estimated an approximately 50 percent increase in normal cost using a discount rate that is higher than what might be used under current economic circumstances.³⁵ For state and local governments as a whole, this would translate into tens of billions of dollars of higher normal-cost contributions in the short term. This leads to the counterproductive incentive to increase risk.

Recent Studies Conclude That Public Pension Funds Are, in Fact, Responding to the Incentive to Take Risk

Several recent studies make clear that the incentive to reach for yield is not just a theoretical issue. Public pension funds appear to be responding to the incentive.³⁶

A recent study by a Yale economist and colleagues at Maastricht University concluded, "In the past two decades, U.S. public funds uniquely increased their allocation to riskier investment strategies in order to maintain high discount rates and present lower liabilities, especially if their proportion of retired members increased more. In line with economic theory, all other groups of pension funds reduced their allocation to risky assets as they mature, and lowered discount rates as riskless interest rates declined. The arguably camouflaging and risky behavior of U.S. public pension plans seems driven by the conflict of interest between current and future stakeholders, and could result in significant costs to future workers and taxpayers.... When facing decreasing bond yields, ... [government funds'] typical discount rates of around 7 to 8 percent can only be maintained by allocating even more assets to equity and alternatives. This riskier allocation can thereby camouflage the level of underfunding ... [which]

amplifies the risk that DB plans will run out of assets before they run out of liabilities” (emphasis added).³⁷

In other words, state and local government pension funds in the U.S. have taken on risk that corporate U.S. funds and funds in Canada and Europe have not.³⁸ They have moved in the opposite direction of what sound investment practice and economic theory would suggest by raising their risk levels even as more and more of their members are retired. This is similar to an older investor moving out of bonds and into stocks as retirement approaches — an extremely dangerous move unless the investor can bear the risk.

Another recent study concluded that “government accounting standards strongly affect public fund investment risk, as higher return assumptions (used to discount pension liabilities) are associated with higher equity allocation and beta. Unlike private pension plans, public funds undertake more risk if they are underfunded and have lower investment returns in the previous years, consistent with the risk transfer hypothesis. Furthermore, pension funds in states facing financial constraints allocate more assets to equity and have higher pension asset betas.”³⁹ The authors went on to conclude, “determining the appropriate discount rate to measure pension liabilities is an important option to reduce state governments’ incentive to take excessive risks.”⁴⁰ And: “Our results suggest that public funds assume more risk if they are underfunded or have lower investment returns in the previous years...” Underfunded plans are taking these greater risks at the same time that the capacities of their sponsoring governments to cover the downside are diminishing.

According to the International Monetary Fund (IMF), “U.S. public pension funds — particularly the lowest-funded ones — have responded to the low-interest-rate environment by increasing their risk exposures.... At the weakest funds, asset allocations to alternative investments grew substantially to about 25 percent of assets in 2011 from virtually zero in 2001, translating into a larger asset-liability mismatch and exposing them to greater volatility and liquidity risks.”⁴¹

The Risk of Underfunding, and Its Potential Consequences, Increase Rather Than Decrease, With Time

The Idea That If We Just Wait Long Enough We’ll Get the Expected Returns Is Simply Wrong

Proponents of using the investment earnings assumption to discount pension liabilities often argue for this on the grounds that it is really not risky — that, over the long run, expected returns will be achieved, and governments are long-lived and can wait for the long run. For example, one analyst has written, “it is not clear that there is much risk for pension funds on projected returns when they are properly calculated. The reason is that a pension fund, unlike individuals, does not need to be concerned about the stock market’s short-term fluctuations. State and local governments do not have retirement dates where they have to

...because differences between expected return and actual returns accumulate and compound as the time horizon extends, pension fund assets actually become more volatile with time, not less.

start drawing on stock holdings. They need only concern themselves with long period averages, without worrying about short-term fluctuations. From this vantage point, there is relatively little risk when pension funds calculate returns correctly.”⁴²

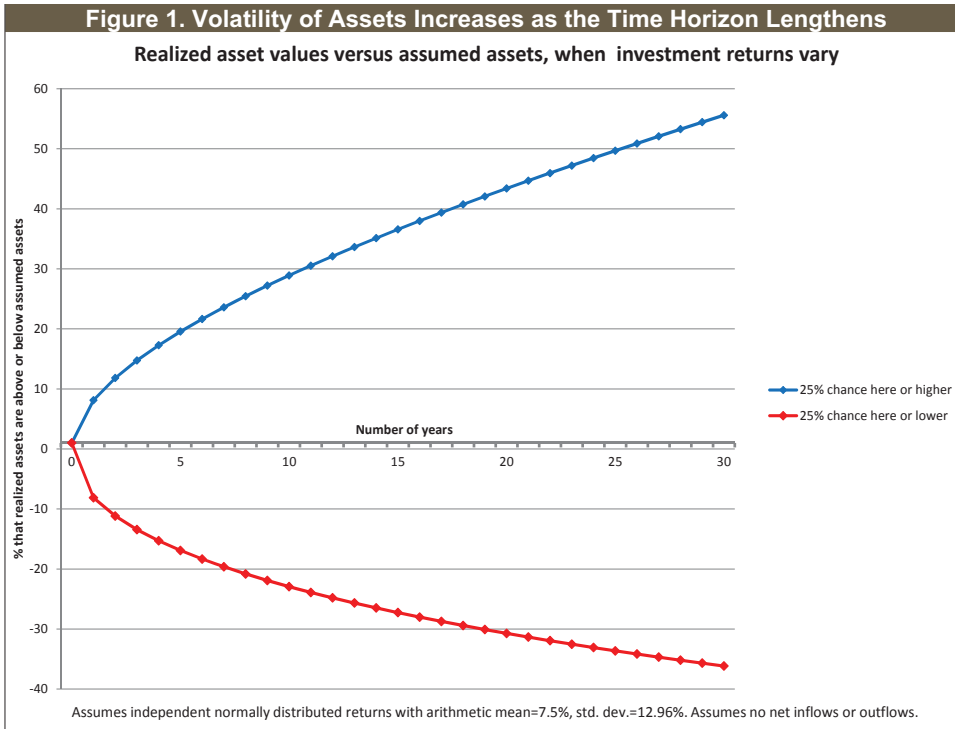
While it is true that the volatility of average earnings decreases as the investment horizon lengthens, that doesn’t make this statement correct. It is well known that a key measure of volatility in investment returns, known as the standard deviation, declines as the horizon increases.⁴³ In fact, if returns are independent from year to year, it declines inversely with the square root of the time horizon — for example, after four years the expected volatility is about one-half what it was in year one, after sixteen years it is one quarter of the expected volatility in year one, and after twenty-five years it is one-fifth as volatile as in year one.⁴⁴

However, this leaves an incredibly broad range around expected average returns. For example, CalPERS currently uses an earnings assumption of 7.5 percent, and it estimates that volatility — the standard deviation of expected returns — is about 13 percent.⁴⁵ This means that, under commonly used simplifying assumptions, there’s about a 68 percent chance that the return in year one will fall between negative 5.5 percent and positive 20.5 percent (7.5 percent plus or minus one standard deviation). Expected volatility in the compound rate of return after twenty-five years would be only a fifth as large, so that there’s about a 68 percent chance that the compound annual return over twenty-five years would be between 4.9 percent and 10.1 percent (7.5 percent plus and minus one fifth of 13 percent) — a spread of 5 percentage points, and there’s about a 32 percent chance that returns would fall outside of even this broad range. Even if we extend the horizon to fifty years, there’s a 68 percent chance that returns would fall between 5.7 and 9.3 percent — and a 32 percent chance that average returns will fall outside that range. Simply put, there is no reason to expect that pension funds will actually “get” their assumed rates of return, just as a gambler’s chances of recouping accumulated losses worsen over time.

Worse, because differences between expected return and actual returns accumulate and compound as the time horizon extends, **pension fund assets actually become more volatile with time, not less.** This is not widely understood, but it is correct. Figure 1 shows the percentage difference of actual assets from average expected assets at the 25th and 50th percentiles, for a fund expecting to earn 7.5 percent on average with a standard deviation of 13 percent, and with benefits and contributions balancing each other out each year. Assets are extremely volatile even in the early years, and become increasingly so as the time horizon lengthens. By year five there is a 25 percent chance that assets will be 17 percent or more below the amount expected, and by year twenty there is a 25 percent chance that assets will be 31 percent or more below expected values. This is an extraordinary amount of risk that has policy, financial, and legal significance.

The Idea That Long-Lived Governments Can Bear Great Risk Is Simply Wrong

The risk to pension fund assets actually increases with time. But because governments are long-lived, perhaps they can accept extreme fluctuations in assets and in required contributions? No, that idea is wrong, too.



There are tradeoffs between stability in funding levels, stability in contributions, and riskiness of assets. If funds choose to invest conservatively, they can have stable assets and stable contributions, but the contributions will be high because expected returns are low. But if funds choose riskier assets in an effort to earn higher returns, initial contributions will be low, but contributions needed to amortize any shortfalls or overages relative to expected assets will be volatile. In the extreme case, if governments restored shortfalls fully and immediately, then funding levels would be stable but contributions

would be enormously volatile. For example, if CalPERS, with \$260 billion of assets, had a 13 percent investment shortfall (one standard deviation from expected return), then California governments could pay \$33.8 billion immediately and eliminate the shortfall right away, keeping the fund stable. That won't happen, of course. At the other extreme, if governments were to amortize this shortfall over thirty years as a level percentage of payroll growing at, say, 4 percent, then their initial payment would be \$1.9 billion (rather than \$33.8 billion), keeping contributions quite stable. But the funding level would suffer; in fact, the initial amortization payment would not even be large enough to cover the first year's interest expense on the shortfall, which would be \$2.5 billion (7.5 percent of \$33.8 billion), and for several years funded status would deteriorate further, until amortization payments grow enough to exceed interest costs and begin reducing the shortfall.

Put simply, governments cannot have it both ways. If they invest in risky assets, they have to accept either very volatile funding levels, or very volatile contributions, or a bit of both.

Contributions Risks Are Large, and Contributions Will Drive Policy Decisions

Contributions are what drive states to decisions. How much might contributions increase?

It is not hard to see that the risk pension plans have taken on is enormous. A simple back-of-the-envelope calculation makes this clear:

- Public pension systems currently have approximately \$3.2 trillion in assets⁴⁶
- A common measure of volatility, the standard deviation of the expected return on assets, is 10 percent or more for many plans. (CalPERS assumes its standard deviation is about 13 percent.⁴⁷)
- Under plausible assumptions, after just one year there's about a one-sixth chance that assets will fall below the expected amount by at least 10 percent (one standard deviation) — that is, by at least \$320 billion.⁴⁸ (If a pension fund assumed it will earn 8 percent, but instead loses 2 percent, that is a 10 percent shortfall.) That is more than state and local governments spend in a single year on highways, police, and fire protection combined.⁴⁹
- If state and local governments were to spread this single-year shortfall over the remaining working life of the workforce — say, over fifteen years — relative to payroll growing 4 percent annually, they would have to contribute an additional \$30 billion in the initial year, rising each year for the next fourteen years. That's the equivalent of the annual cost of employing about 300,000 teachers.
- That's an example of the real-world choice many governments would face. Most cannot simply dip into reserve funds in the hope that future returns will be better. If returns fall short, they will have to cut services or raise taxes.
- So long as pension funds invest in risky assets, governments and their stakeholders will bear these risks. As discussed earlier, this risk does not diminish with time — the magnitude of likely shortfalls or overages increases with time (see *"The Idea That If We Just Wait Long Enough We'll Get the Expected Returns Is Simply Wrong"*).

It is possible to obtain more sophisticated estimates of the risk that plans are taking by using simulation models. We created a simple simulation model of a hypothetical pension system with features similar to CalPERS. The model assumes current assets of \$260 billion, an expected investment return of 7.5 percent, and a standard deviation of 12.96 percent.⁵⁰ This hypothetical system has a 25 percent chance of asset shortfalls within five years requiring an initial amortization payment of \$7.9 billion, growing to \$10.6 billion in the fifteenth and final year. (If the amortization

Because large investment shortfalls often occur in economic environments that are bad for state and local government finances, the requirement for increased contributions often will come when governments already face great fiscal stress.

period were stretched to thirty years, the initial payment would be \$5.1 billion and the payment in the thirtieth and final year would be \$16.5 billion.) The system would face similar upside risks as well.

Since this hypothetical fund is similar in many ways to CalPERS, it gives a sense of how large contribution increases might have to be in California. Depending on the amortization period, the contribution increase could be the equivalent of an income tax increase of more than 10 percent, or a cut in spending equal to about a third of what all state and local governments in California spend on police protection.⁵¹ And if CalPERS had investment shortfalls, the California State Teachers Retirement System (CalSTRS) and the University of California Retirement Systems likely would have investment shortfalls, also, so that the combined impact on the California economy would be much larger still.

Because large investment shortfalls often occur in economic environments that are bad for state and local government finances, the requirement for increased contributions. An underfunded pension plan, like an individual who borrows heavily to finance a lifestyle and increasingly finds debt servicing payments to be intrusive, is vulnerable to unpredictable events. How would the state's political process deal with such a large requirement at such a hard time — would it raise taxes or cut spending enough to find what likely would be well over \$5 billion in annually needed funds? Or would it seek to cut benefits? Or to gamble further, deferring make-up contributions by even more than the amortization allows, with additional smoothing techniques? It's hard to say, but these numbers are large enough, even for California, to test its resolve to meet promises. Taxpayers, other stakeholders in governments, and workers and retirees counting on retirement promises all would be at risk, and the risk might become legally actionable if funds become diminished or impaired.

CalPERS itself has examined similar issues of risk. In its latest Annual Review of Funding Levels and Risks, it concluded:⁵²

...there is considerable risk in the funding of the system. Unless changes are made, it is likely that there will be a point over the next 30 years where the funded status of many plans will fall below 50%. There is a not insignificant probability that we will see funded statuses below 40%. It is likely that we will see employer contribution rates for the State Miscellaneous plan in excess of 30% of pay at some point in the next 30 years. There is almost a 50% chance of the employer contribution to the CHP plan will exceed 50% of pay over the same time period. Finally, the probability of large single year increases in employer contribution rates at some point ranges from 15% to 82% depending on the plan and the size of the increase.

In pointed understatement, the report goes on to say,

There is a substantial risk that, at some point over the foreseeable future, there will be periods of low funded status and high employer contribution rates. Should this coincide with a period of financial weakness for employers or if such a period occurs before we recover from the current funding shortfall, the consequences could be very difficult to bear.

Combined, the measures discussed above indicate that employers will be under continuing financial stress for many years unless there is a period of exceptional returns in the markets.

Reaching for yield poses real risks to pension funds, the governments that contribute to them, and the taxpayers, government service beneficiaries, and workers and retirees whose lives could be disrupted by a pension system in trouble.

It Is Bad Public Policy to Create a System Likely to be Underfunded Half or More of the Time

The typical pension system has probability that earnings projections will not be achieved one-half or more of the time, and that current unfunded status will be worsened. The extraordinary amount of earnings risk makes it more possible that the liabilities of pension funds will exceed assets and the funds will be unable to meet their commitments when due.

A policy that contains an abnormally high probability of failure is an unsound and unacceptable public policy. Underfunding pension obligations is a form of deficit spending and is at variance with the requirement of forty-nine states that their operating budgets be balanced.

The greater the underfunding of a pension system, the more likely it becomes that the government will seek to impair the pension contract. Underfunding itself may constitute impairing. Setting up a system that claims to provide strong legal protections for pensions and yet allows systemic underfunding to persist, is bad policy and puts pensions at risk, both financially and, possibly, legally.

Some Public Pension Systems Create Additional Moral Hazards

When a person can take risk that others must bear, it creates a moral hazard. Pension funds invest in risky assets, but governments and, through them, taxpayers and stakeholders, and workers and retirees, *bear* this risk. This moral hazard puts at risk the moral obligation to keep promises made to employees. Another moral hazard occurs when pension benefits are set in state law for local governments that do not have a say in the level of benefits. In states with state-run systems that local governments contribute to, the local governments are captives of the state: In such states, if the state raises or lowers benefit levels or

changes the funding arrangements, the local governments have to live with the result.

Workers, Retirees, and Other Stakeholders in Government All Bear the Risk From Contribution Increases

Large and unplanned for contribution increases pose clear risks to government services and their beneficiaries, and to taxpayers and fee-payers who finance those services. The Task Force previously documented this crowd-out effect in California, where governments have been hit particularly hard, reflecting retroactive benefit increases adopted in the late 1990s and investment shortfalls since then.⁵³ Spending cuts have fallen disproportionately on courts, the university system, welfare system, and parks.⁵⁴ For example, retirement costs in San Jose, California, increased from \$73 million in 2002 to \$245 million in 2012. Over that same period, the city workforce shrunk from over 7,400 employees to 5,400 and police staffing shrunk by 20 percent even while total spending on the police department rose significantly as a result of retirement costs.

Well-funded retirement systems do not mean that governments are free from fiscal stress. The high actuarial funding levels of New York's State and Local Employees Retirement System and its Teachers Retirement System result in part from a conservative actuarial cost method that tends to require greater contributions earlier in employees' careers and responds quickly to adverse actuarial experience, and from a court decision requiring governments to pay the contributions requested by the systems.^{55,56} However, plans in New York are relatively expensive.⁵⁷ When these plans experience significant investment shortfalls, annual required employer contributions increase sharply, governments generally must pay those higher contributions, and the increases are large relative to budgets because benefits in New York are relatively high. Based on projected contribution rates from the New York State and Local Employees Retirement System, between 2010 and 2014 required employer contributions will increase by approximately 182 percent, or about \$3.7 billion annually, all else equal.⁵⁸

When the required contributions get large enough, if politicians are unwilling to impose further costs on taxpayers and service beneficiaries, workers and retirees will be at extreme risk. When governments cannot control one component of compensation — pensions — they naturally turn to wages and the number of workers, components of compensation over which they have more control. As labor costs rise, workers see lower salaries and fewer jobs, and a dominant policy intervention to fix the underfunding has been to slash benefits for new workers. But to the extent benefits are reduced, demands for other compensation may be increased.

Until recently, pension benefits had not been a target of cutting, but now they are, with force. Prior to 2005, legislation to

reduce pension benefits or increase employee contributions was rare. In this most recent crisis, states have been actively engaged in both.⁵⁹

Between 2009 and 2013, almost every state adopted major pension changes. Among the few that did not, Alaska and Oregon had adopted significant changes previously (and may consider further changes). Only Idaho, with an 89.9 percent actuarial funding ratio in its public employee retirement system, appears to have avoided significant benefit or contribution changes.

The most common kinds of benefit changes have been higher age and service requirements for retirement eligibility, although several states have lengthened the period for the final average salary calculation or reduced the percentage multiplier. Most benefit changes apply primarily to new hires, but a few have adopted changes affecting existing employees: for example, in Vermont, changes affected teachers more than five years from retirement eligibility, and changes in Colorado affected employees with less than five years' membership. Recently adopted changes in Illinois affect retirement age eligibility for current employees.

At least ten states have reduced cost-of-living increases. These have been targeted primarily at new employees, but in 2010 and 2011 six states adopted restrictions on COLAs that could affect existing retirees: Colorado, Maine, Minnesota, New Jersey, Rhode Island, and South Dakota. Most if not all are the subject of litigation, "but lower courts in Colorado, Minnesota, and South Dakota have held that COLAs either are not part of the pension contract or, if they are, that changing them is permissible under the state's police power." At least thirty states have increased contribution requirements for employees, and existing employees have been hit by these increases in at least twenty-three states.

Crowding Out Is Creating New Tensions and Political Dynamics

The crowding out phenomenon is quite significant and perhaps misunderstood. The increasing substantial amount of annual required contributions, exacerbated by the risks of underfunding status, creates legal and political contests, and very unwelcome stress with possibly profound implications. One contest is between pension holders and bond holders and the primacy of the legal commitments to each. Currently, this contest is being litigated in the Chapter 9 bankruptcy cases of San Bernardino, California, and Detroit, Michigan, both of which have been found eligible to be in Chapter 9 and in each, to date, pension funds or beneficiaries are considered general creditors (CalPERS in Stockton). Heretofore, investors in a government's general obligation debt generally assumed such debt enjoyed a primacy provided by the full faith and credit of the issuing government. But bond investors take an informed risk; pension holders do not think they do, as their pension benefits fundamentally are deferred compensation. Yet in the aforementioned bankruptcies, the

governments are insolvent and the promises to bond holders and pension holders may not be kept and neither promise may be deemed superior to the other. This confusion could lead federal courts to make determinations about what would otherwise be state legislative prerogatives, and perhaps creating regrettable political conflicts in state legislatures between labor and capital.

Another contest is between pension beneficiaries and taxpayers. As pension obligations grow, so does taxpayer resentment. Taxpayers are the public sector analog to shareholders in the private sector. The Great Recession of 2007-2009 might be termed the Great Awakening in the sense that it caused taxpayers to become increasingly aware of the cost of pension obligations to governments starved for revenues. To meet pension obligations, representatives of pension beneficiaries advocate new taxes. Taxpayers resist and are winning that political issue in some states, with the notable exception to date of California, creating not only crowding out of tax levy funds available for education, health care, and other essential government services, but argumentation to change pension laws to the detriment of current and new government employees. The long term political and economic consequences of such advocacy is not known.

Lastly, there is an emerging and profound contest between heretofore natural allies, i.e., public employee labor unions and the vulnerable who are dependent on social service programs. The contest between them for declining government resources could fray their mutual, constructive support of social justice.

Most states have engaged in pension "reform" efforts since the onslaught of the 2007 recession and the accompanying, precipitous drop in government revenues. In those states where public employee unions are prevalent, there has been determined labor resistance to reform efforts. One of the consequences has been that reforms mostly affect new hires, i.e., invisible persons who do not vote in union elections, have no powerful political champions, and who will not make substantial demands on pension systems for a generation. The long term projected savings of pension costs for new hires has almost no ameliorative effect on the current unfunded status of the pension systems they join although, if new hires are required to make higher contributions (offset possibly by lower government contributions), the pension systems will get a marginal improvement in current revenues. But another consequence of crowding out, which occasions contentious legislative reform efforts, is that labor's resistance occupies its resources negatively so that much of the rest of labor's legislative agenda can be delayed.

An irony of crowding out is that the ability of governments to meet the core promise of retirement security is not really improved. Rather, the promise is changed, creating the possibilities that less qualified persons will be attracted to government careers and those who are attracted may have less economic power in retirement. To the extent that one of the primary objectives of public

pensions is to create a stable middle class, a policy that focuses pension reform on new hires and extends the current consequences of crowding out may frustrate that objective.

Another irony of crowding out is that there are inherent limitations to the extent that government resources can be diverted from essential services like education to pensions, both because voters and taxpayers will resist, and because they are mobile and can move elsewhere. There simply may not be enough government resources to meet the requirements of all needs. Thus, crowding out puts a restraint on remedying pension underfunding and that restraint could build a bridge too far in pension underfunded liabilities in certain states and cities – elected officials may be unwilling to fund deeply underfunded plans fully. Political tensions could be aggravated, insolvency could ensue, and unpleasant change may be occasioned from unwelcomed impositions.

Governments Face Too Little Discipline to Make Contributions

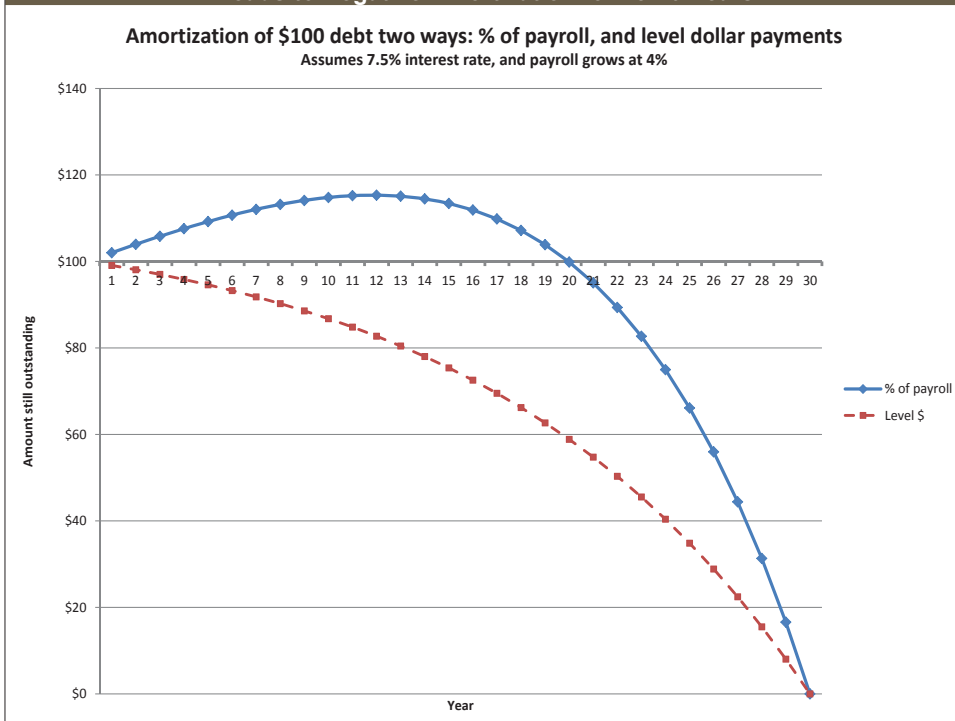
The current system of funding pensions can work, in principle, if governments are willing to make the contribution increases required when investment returns fall short. In practice, this often is not so.

Artful Underpayment of Needed Contributions

When investment income falls short of expected returns, cur-

rent actuarial practice is to amortize the pension debt over a thirty year period on an increasing payment schedule, where payments are a constant percentage of rising payroll. This results in negative amortization for nearly half of the payment schedule leaving the debt larger than its initial value for twenty or more years. Figure 2 shows the implications of this for a typical amortization scheduled compared to level dollar amortization. This practice can leave pension funds with a substantial debt for decades, making them vulnerable to another market downturn over the medium term.

Figure 2. Typical level Percent Amortization of Investment Gains & Losses Leads to Negative Amortization for 15-20 Years



Willful Underpayment of “Required” Contributions

Many of the retirement systems in the deepest trouble have gotten there through benign or malign neglect on the part of their sponsoring governments. Most governments have exacerbated investment income shortfalls by contributing too little to retirement systems, largely intentionally. There is no formal accepted set of rules for how governments should fund their pension obligations. Heretofore, actuaries have calculated an “annual required contribution” (ARC) according to generally accepted accounting principles (GAAP).⁶⁰ Despite the name, neither accounting nor actuarial standards have required governments to pay the ARC.⁶¹

Some state statutes have required governments to contribute the ARC and some governments have contributed the ARC as a matter of practice. However, many governments pay less than the ARC and, in some cases, these lesser payments are set out in statute. The Pew Center on the States noted in their latest report that only nineteen states paid at least 100 percent of their ARC.⁶² From 2007 through 2011, governments underpaid ARCs to major plans by \$62 billion. These underpayments were heavily concentrated in a few states, with governments in California, New Jersey, Illinois, and Pennsylvania each underpaying by \$9 billion or more, often as part of a longer pattern of underpayment.⁶³

The systems in the worst financial trouble generally have had the worst record of contributions, or have borrowed against pension obligations to pay other bills, or have taken other actions that have increased underfunding.

Illinois steadfastly has insisted on contributing less than actuaries calculate, and even enacted statutory “ramps” that ensured it would contribute less than actuarially required amounts for decades.⁶⁴ Although Illinois, like other retirement systems, has had large investment shortfalls over the last decade, it is in much worse shape because of its inadequate contributions and now has actuarial funding levels below 40 percent for its major plans. Despite having lax rules for itself, Illinois requires local governments that participate in its state-run Illinois Municipal Retirement Fund to contribute the annual required contribution prepared by actuaries.⁶⁵ Illinois has enacted legislation that requires a new contribution “ramp” designed to achieve full funding for its major plans by 2044.⁶⁶

New Jersey, too, has deeply troubled plans. New Jersey underpaid its ARC by \$14.5 billion from 2006 through 2012. It has since established a “ramp” designed to put it on a path to paying the full ARC by 2018. But catching up is expensive: the increases in annual contributions required to comply with the ramp are the equivalent of about 40 percent of a year’s worth of school aid.⁶⁷ Finding that kind of money, annually, will be a huge challenge for New Jersey and it will face great pressure to defer or reduce these contributions.⁶⁸

In California, governments are required to pay most CalPERS funds what they request. But CalSTRS and the Judges Fund within CalPERS are a different story: Between 2006 and 2011,

governments underpaid the ARCs to these funds by approximately \$15 billion in total.

The governments and retirement plans that are in greatest trouble have been, as Alicia Munnell of the Center for Retirement Research at Boston College has described them, “bad actors.”⁶⁹ Most have underpaid required contributions, or adopted substantial benefit increases, including retroactive increases. But even systems that are not in current trouble are at risk: Investments in risky assets mean that plans charged with meeting hard-to-change liabilities could again face large shortfalls in investment earnings relative to expectations. Their incentives to underfund and invest with substantial risk are similar.

Encouraging Contribution Discipline

Some states impose contribution requirements on their local governments, and establish enforcement mechanisms. For example, local governments that participate in the Illinois Municipal Retirement Fund must contribute the actuarially determined amount, and may levy a special tax to do so.⁷⁰ In addition, the Illinois Municipal Retirement Fund (IMRF) Board has authority to enforce collection of the annual required contribution each year and can sue governments for failure to pay, or ask the state to withhold other funding to the governments.⁷¹ In New York, the state and local governments participating in the state-administered system must contribute amounts determined by the retirement system, under a 1993 court decision.⁷² (The state has enacted several laws that weaken this protection by establishing mechanisms allowing governments to, in effect, borrow from the pension funds to pay a portion of their contributions.⁷³) New York has an extremely strong enforcement mechanism for school districts: it deducts pension contributions directly from state aid otherwise payable to school districts, so that failure to pay is not an option.⁷⁴ In Rhode Island, the Pension Study Commission is examining whether state aid to school districts should be intercepted to the extent any municipality fails to meet its ARC, although the Commission has noted that this requires careful legal review because of its potential to affect the security and rating of school district bonds.⁷⁵

It is one thing for a state to impose a contribution requirement on a lower level of government, and entirely another for a state to impose requirements on itself — to try to bind its own hands. In principle, states can establish contribution requirements in their constitutions. Louisiana is one of several that do this, although it and others generally grant the legislature flexibility in determining contribution amounts.⁷⁶ In 1987, in response to deep underfunding, the Louisiana legislature amended the constitution to require sound actuarial funding and established a forty-year amortization schedule with rising annual payments.⁷⁷ It also required payment of the normal cost plus amortization and established an enforcement mechanism: “If, for any fiscal year, the legislature fails to provide these guaranteed payments, upon

Governments need rules and mechanisms to ensure that contributions are made.

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.”⁷⁸ The legislature has made the annual contributions required by this provision, but Louisiana pension systems remain among the most underfunded in the nation, a result of the long amortization schedule the legislature authorized itself to adopt, plus subsequent investment and actuarial losses.⁷⁹

Another approach is to think of pension liabilities as similar to government debt so that whenever a government fails to fund its required contribution, it is committing a technical event of default. (Certainly, the rating agencies, in assessing the creditworthiness of issuers of municipal debt, view pension underfunding as a factor.) For sure, a pension is akin to borrowing from an employee (by deferring compensation) just like a bond is borrowing from an investor. But other than the yield penalty that may be imposed by the municipal debt markets, there is no legal remedy to pension lenders, i.e., employees, retirees, and taxpayers, if a contribution default were to occur. One approach could be to include a covenant in general obligation bonds issued by sponsoring governments that they will make the annually required actuarially determined contributions to their primary pension funds.

In 2011, New Jersey tried a variant to this approach: it committed the state to a seven-year ramp of increasing annual contributions, with full annual payment required in year seven and each subsequent year, and it created a statutory cause of action for pension beneficiaries should the state fail in any year to make its payment in accordance with the statutorily prescribed ramp. So did Illinois in its new reform legislation. To make the cause of action meaningful, New Jersey, by statute, barred itself from invoking the defense of sovereign immunity, if sued.⁸⁰ However, a subsequent legislature could change the statute and the state, if sued, would have a full array of other legal defenses available.

Yet another possible approach to ensuring that employer contributions are made is to use a dedicated revenue source, and there is some precedent for this. In Arizona, a statutorily specified share of judicial fees subsidizes the employer contribution rate for judicial and elected officer retirement system, and a portion of taxes paid on fire insurance policies is used to fund firefighting services and the firefighters relief and pension fund.⁸¹ In Florida, municipal police and fire plans receive a premium tax on fire and property insurance.⁸² The Kansas legislature in 2012 approved legislation to dedicate a share of state gaming revenues from state-owned casinos and from the sale of state surplus real estate to the Kansas Public Employee Retirement System’s unfunded liability.⁸³ Finally, depending upon the specific retirement system, Oklahoma dedicates a share of the income tax, sales tax, lottery, or insurance premium tax toward pension contributions.⁸⁴

A dedicated revenue source is not a guarantee that payments will be made, or that the retirement system will be well funded.

The Oklahoma Teachers Retirement System is among the worst funded in the nation.⁸⁵ Governments often are resourceful in undermining the intent of dedicated revenue sources, whether for highways, education, pensions, or other purposes. One study found that having a dedicated tax for pension contributions tended to reduce, rather than enhance, funding levels, perhaps because it reduced the pressure to make contributions from other sources.⁸⁶ Still, in states that habitually underpay pension contributions, a well-designed dedicated revenue source linked to conservative actuarial assumptions might create a political environment that makes it hard to avoid making sufficient pension contributions. There is no ideal mechanism.

The System Is Opaque: Liabilities and Risks Must be Disclosed

Pension liabilities, the costs of funding those liabilities, and the consequences of investment risks are poorly reported and disclosed. As one participant in the National Dialogue on Underfunded Pension Promises, held on April 19, 2013, put it, “defeat and pay, or disclose the risks.”⁸⁷ As the discussion earlier of CalPERS makes clear, those risks can be huge. Systems do disclose information on risks, but at present risk disclosure is neither comprehensive nor uniform.

Governments’ Comprehensive Annual Financial Reports (CAFRs) do not generally disclose the likely range of outcomes in funded ratios or in contributions that could be required of governments, although recent changes and proposals could lead to modest improvements.⁸⁸ Several recent reports and analyses have offered ways to improve pension transparency and disclosure, although the focus generally has not been on the consequences of investment risk.⁸⁹ The most notable analysis is a discussion draft by the Pension Committee of the Actuarial Standards Board, seeking comment from industry professionals on the appropriateness of requiring actuaries to assess investment risks, interest rate risks, longevity risks, and other risks, using tools such as scenario analysis, stress testing, and stochastic models.⁹⁰ The American Academy of Actuaries expressed concern that such a requirement would go beyond the capability and charge of many actuaries.⁹¹ By raising the question of investment risk, the discussion draft moves in the right direction. It did not focus on the implications of that risk for governmental contributions, although a more detailed draft might.

What is needed is much clearer disclosure of the consequences specific investment policies might have, in different investment environments, not only for the funded status of pension plans but also for the contributions that may be required of governments. Disclosure of cash flow projections for ten to twenty years has been advocated by several experts. Only by highlighting what might happen to contributions by governments can stakeholders in those governments understand the consequences for them of

pension fund investment risk. Standards setting bodies such as the Actuarial Standards Board should continue to examine ways to make investment risk and its consequences clear.

Disclosing Risk Is Not Enough: External Pressure to Dampen Risk-Taking Also Is Needed

Better disclosure of the risks that pension funds are taking and the potential consequences to stakeholders is important, but it is not enough. A fundamental moral hazard would remain: those who take the risk do not bear the risk. Pension funds would continue to have incentives to reach for yield in an effort to justify investment return assumptions and keep required contributions low. Government officials would have an incentive to acquiesce in risky investment assumptions, to keep near-term contributions low, thus avoiding decisions about services to cut or taxes to increase. Unions would have an incentive to acquiesce in risky investment assumptions, to keep near-term contributions low, avoiding a build-up of political support for cuts in benefits, cuts in employment, or downward pressure on wages. And those most at risk — stakeholders in government services and investments such as education, the courts, care for the needy, and infrastructure, and the taxpayers and fee payers who foot the bill as well as future government hires — will not have a say in the risk they are bearing.

What is also needed is an effort to dampen incentives for risk taking. Disclosure will help, but governments should develop formal statements of the contribution risk that they are willing to bear, and pension funds

should consider such statements explicitly as they develop their investment policy statements and asset allocation policies.

These Flaws Have Existed for Decades But Create More Risk Now Than Before

The flaws we describe above have existed for many decades, but the risks they create are rising. First, as Figure 3 shows, public pension funds are increasingly invested in equity-like assets: nearly an all-time high at 65 percent in 2012, up from 38 percent in 1990 and 21 percent in 1980.⁹² If equities

Figure 3. Public Pension Funds Share of Investments in Equities, Real Estate, and Alternatives Are at Near-Record Highs Despite the 2008-2009 Market Drops

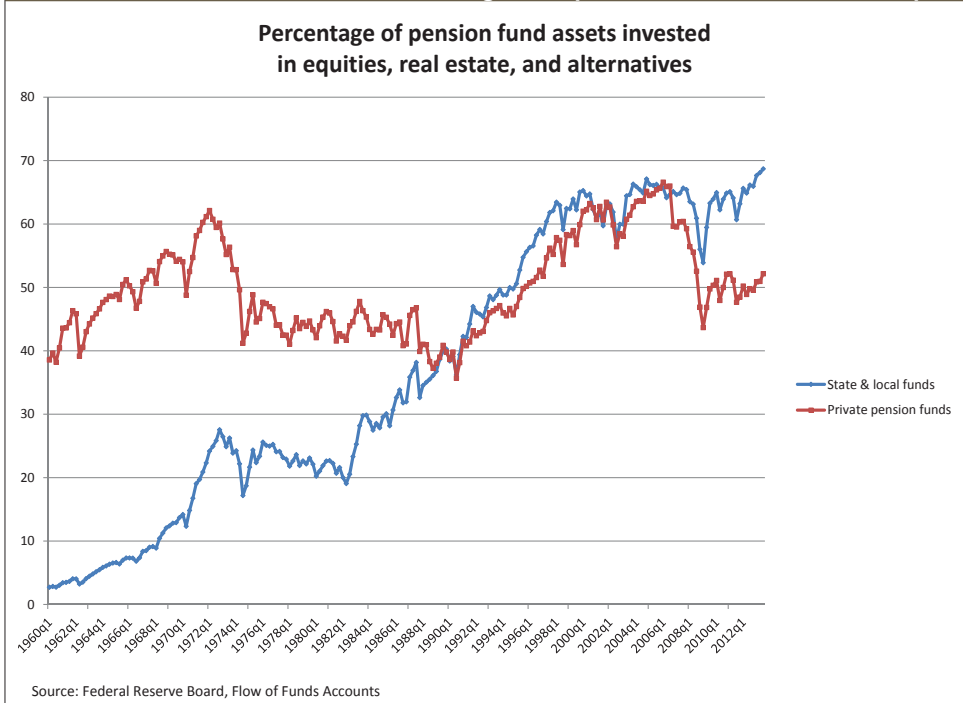
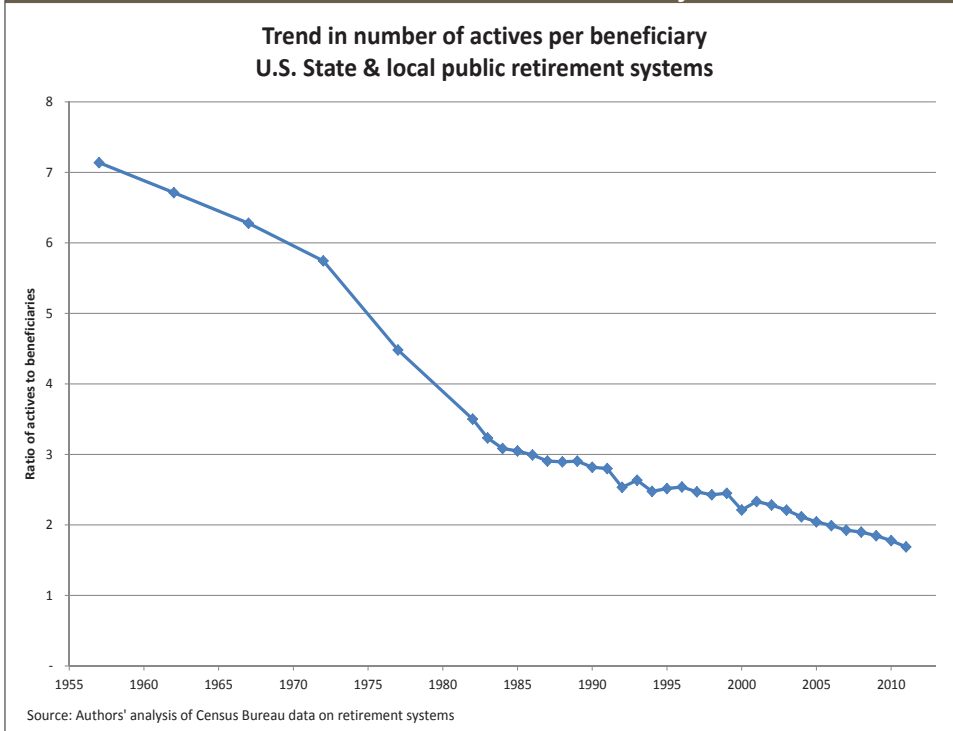


Figure 4. As the Population Ages, Retirement Systems Are Maturing, With Fewer Workers Per Beneficiary



fall by 25 percent at a time when they constitute 21 percent of a fund’s portfolio, that’s a loss of about 5 percent, but if they constitute 65 percent of the portfolio, it’s a loss of 16 percent – more than three times as much.⁹³

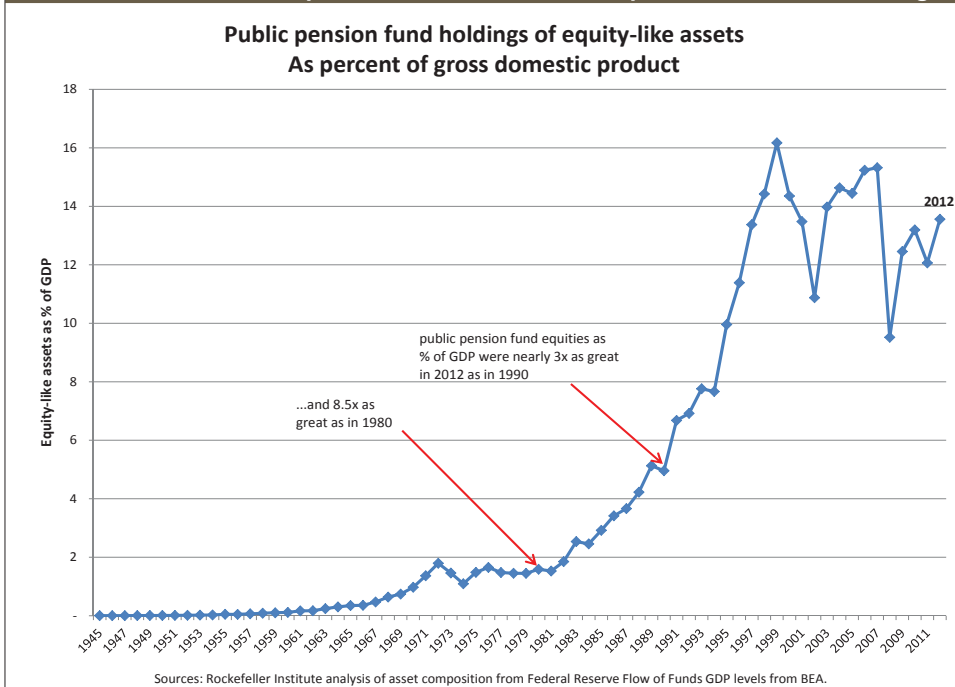
Second, as the population ages, and the state and local government workforce ages with it, retirement funds are becoming more mature. In 1980, the number of active participants per beneficiary was about 3.8, by 1990 it had dropped to 2.8, and by 2011 it had dropped to 1.7 – a 28 percent drop.⁹⁴ (See Figure 4.) Thus, there are relatively fewer employees paying contributions into

the system and far more people receiving benefits. This phenomenon is particularly problematic in underfunded systems.

Systems now are more mature, with more assets, and are far more reliant on investment income. In 1980, state and local government pension fund assets were about 7 percent of the economy. By 2012, that figure had risen to more than 20 percent of gross domestic product – three times as much. About 23 percent of 1980 assets were in equities, while in 2012, 67 percent were in equities (see Figure 4). Thus, a 25 percent decline in pension fund equities in 1980 would have amounted to about 0.4 percent of GDP (assuming other assets were unchanged), but the same percentage decline in 2012 would have been 3.6 percent of GDP – more than eight times as much.⁹⁵ State and local retirement systems are far more susceptible to swings in financial markets now than they were three decades ago, or even two decades ago. (See Figure 5.)

Third, as retirement funds mature, benefit payments to the growing numbers of retired workers increase more quickly than contributions from employers and workers, so the funds, particularly underfunded ones, increasingly have net outflows before considering investment earnings. In 2012, for the United States as a whole, state and local government retirement systems had net outflows of \$106 billion before reflecting investment earnings. In 2000, net outflows in inflation-adjusted dollars were only \$46 billion and in 1991 and all previous years funds had net inflows – contributions exceeded benefit payments (see Figure 6).

Figure 5. Consequences of equity Price Declines Now Are MANY Times Greater Than the Consequences of Similar-Sized Drops Two-Three Decades Ago



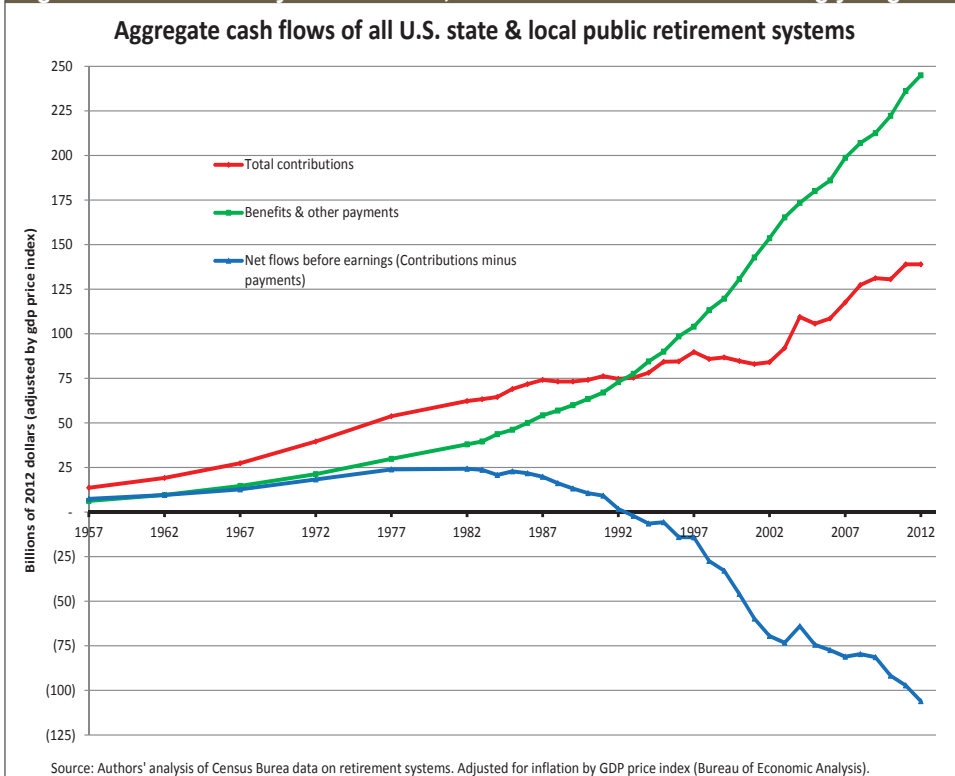
associated endnote demonstrate, this is not a trivial issue even though it is quite technical.⁹⁶ As pension funds mature and net outflows increase, asset values will be more volatile and more susceptible to the order of returns.

In 2012, net outflows were 3 percent of assets — in other words, funds had to earn 3 percent on investments simply to keep assets from declining. One quarter of retirement systems had net outflows of 4.5 percent or more. When a fund has net outflows, investible assets are declining (before investment income), leaving less available to invest in the next year. Thus, order matters when returns are volatile — it is much better to receive high returns early and low returns later, even though both streams provide the same compounded growth rate.

As calculations in the associated endnote demonstrate, this is not a trivial issue even though it is quite technical.⁹⁶ As pension funds mature and net outflows increase, asset values will be more volatile and more susceptible to the order of returns. In an environment in which expected returns are low in the short term — as the current low-interest-rate, low-inflation environment may be — funds cannot simply balance low returns in the short term with high returns later; they will need much higher returns later because investible assets will be lower than they otherwise would have been. This is an argument against pension smoothing techniques that some states employ artificially to reduce their annual pension contributions in fiscally difficult times.

If funding levels had been estimated using

Figure 6. As Pension Systems Mature, Their Cash Flows Are Increasingly Negative



lower-risk discount rates, they would have been estimated to be underfunded, although the difference between assumed returns and low-risk yields was much smaller in 2000 than it is now.⁹⁷

Flawed incentives are a greater problem now than ever before because pensions are much more heavily invested in equities and are more reliant on investment income. The current low-interest-rate environment only increases the challenges. The lack of consensus on standards means there is opportunity for governments and pension funds to step up and change practices even if standards do not guide them.

Bad incentives, inadequate rules, and opaqueness plague public pension systems. Standards and practice encourage underestimation of liabilities and of the cost of funding those liabilities. This makes pension systems look artificially healthy. It creates incentives to provide benefits that may not be affordable, and, most importantly, to keep contributions lower than they would otherwise need to be. The system encourages pension funds to reach for yield and to take risk that others must bear. And it often enables governments to underfund needed contributions when the inevitable downside risks occur. All of this is abetted by a lack of clear information on liabilities and risks. These flaws have existed for decades, but the risks are far greater now than before. The spread between the higher discount rates commonly used and appropriate risk-free rates has widened considerably. We offer a set of recommendations

Resolving Deeply Underfunded Plans

Minimizing bad incentives, requiring discipline, and disclosing liabilities and risks can strengthen retirement systems going forward and help ensure that newly promised benefits are properly valued and funded. But discipline and disclosure can do nothing to resolve problems of the deeply underfunded plans that currently exist. In these cases, governments and stakeholders must make judgments about what changes may be permissible, in a complex and unsettled area of law.

The Law: What Is Promised and What Is Legally Protected?

State and local governments face challenges in resolving pension problems that the private sector does not face. Public pension benefits are largely defined in law and often have special legal protections. For example, private firms generally have the power under the Employee Retirement Income Security Act (ERISA) to change benefits that will be earned in future years, but state governments — depending on the state and judicial interpretation — either cannot change these benefits at all, or can only do so by statutory change.⁹⁸ Thus, state governments must act through elected legislatures where power is diffused and can be reallocated by frequent elections and events. Legal structures in the public sector impede change.

Obstacles to Public Pension Benefit Changes

An important impediment to change is that states do not have access to the bankruptcy courts. And, while municipalities in about thirty states can file for protected debt reorganization under Chapter 9 of the U.S. Bankruptcy Code, that is viewed as an extreme last resort to which access is limited by uncertainty, reluctance, cost, political pressures, and state laws. A Chapter 9 filing is a venture into the unknown and the enforceability of government pension commitments in Chapter 9 is currently being tested and remains unresolved.

State public pensions are created by legislation and enjoy legal protections through statutory and constitutional provisions and judicial decisions; they cannot be changed by administrative fiat nor, generally, by collective bargaining. The first line of defense for those who oppose pension changes is to frustrate legislative efforts. The second line of defense is to challenge legislative modifications in the courts. The degree of legal protections for pensions varies by state and by court, and also is dependent on whether proposed modifications are substantial.

Public Pension Contracts

The most important legal consideration for states pursuing pension legislative changes is whether there is a binding, legally enforceable contract between the employer and the employee that vests rights at the time of hire, at a point during the employee's tenure, or at retirement. If a contract exists, it enjoys protection by virtue of Article One, Section 10, of the U.S. Constitution, which provides, in part, that no state may pass any law that diminishes or impairs the obligation of contracts. The breadth of this U.S. constitutional protection depends on the terms of the contract and the materiality and circumstances of subsequent legislatively enacted modifications.

The vast majority of states that have considered the issue adhere to the theory that a pension contract is created by virtue of public service employment.⁹⁹ These states regard pensions as deferred compensation. A contract may be declared in the underlying legislation, prescribed by explicit state constitutional language, or found or implied and so determined by the state courts.¹⁰⁰ Whenever a state constitution explicitly prescribes that a contract exists, the state constitution usually also provides that the benefits of the contract cannot be diminished or impaired.

In states that do not have explicit constitutional protection of pensions but where courts have found legislative intent to create a contract, or have implied contracts without finding clear legislative intent to enter into a binding contract, constitutions frequently have general contract impairment clauses that mimic the federal contract language so that pension promisees often enjoy both federal and state constitutional protection against impairment of any contract.

Defining the Contract and Modifications That Do Not Impair the Contract

If a pension contract is deemed to exist, the most important questions in assessing the constitutional protection are: (1) When is the contract created? and (2) What are its terms? Subsequently important questions are: What is the essential promise that the contract protects? And, is there clear, unambiguous legislative intent to establish a contract; to bind future legislatures to the contract's terms; and, thereby, relinquish the sovereignty of the state to make future changes?

If the contract becomes operative when the employee is hired, a common interpretation is that the employee is guaranteed the benefits of the pension plan in effect at the time of hire and that there can be no impairment or diminishment of the benefits of that plan so long as the employee is employed or retired — under this interpretation, the rate at which benefits are earned, even for years not yet worked, cannot be changed. By explicit constitutional language, this is understood to be the law in New York and Illinois (although newly enacted legislation may test the limits of the Illinois constitutional protection), and by case law it is essentially the law in California and is the law to varying degrees in at least twelve other states.^{101,102} Thus, in those states it is generally assumed that the only substantial pension reforms that can be effected within the terms of the contract are limited to new hires. Because unfunded liability, by definition, pertains only to current and former workers, changes for new hires cannot reduce unfunded liability.

By contrast, if the contract is deemed executory as and when the employee performs services and earns benefits, the general interpretation is that accrued benefits have constitutional protection, but prospective benefit accruals not yet earned through services rendered do not.^{103,104} Even so, it may be legally permissible to change benefits that current employees will earn with future service, but these changes are strongly resisted politically. Under ERISA (which does not generally apply to state and local government pensions), private sector employers may change benefits that current employees earn with future service.

In general, benefits attributable to future service are not included in accrued liabilities of pension funds, nor, by extension, in their reported unfunded liabilities. Thus, changes to future benefit accruals ordinarily will not reduce unfunded liabilities. Nonetheless, these changes will reduce future employer contributions for service not yet accrued and thus will provide fiscal savings to state and local governments more quickly and substantially than will changes that only affect new hires.

The Core Promise

Several courts have held that the “core” promise of a pension contract has the strongest legal protections. With respect to the core promise, some legal analysts have argued recently and

increasingly that the contract creates a reasonable expectation of a “substantial pension,” to be interpreted in accordance with statutory terms, e.g., a certain percentage of a final average salary multiplied by the number of years of service. Under this argument, subsequent modifications such as changes to cost-of-living adjustments, retirement age, and employee contribution rates may not necessarily be part of the core promise in the same way as the “substantial pension,” and thus might be more amenable to legislative change. A key consideration in whether it is permissible to modify these elements concerns the reasonable expectations of the promisees, and the extent to which they have relied on those expectations. This argument has been refused in some courts.

Changes That May Impair the Contract, or Where There Is No Contract

Where a contract is determined to exist, there nevertheless may be modifications impervious to constitutional challenge if the modifications were to be a proper exercise of the state’s police power, as reasonable and necessary to serve an important public purpose.¹⁰⁵ The police power is plenary. However, the U.S. Supreme Court has limited the important public purpose exception quite substantially, which in respect of pensions would be the basis of an exercise of police power. Thus, e.g., an impairment of a constitutionally protected contract would not be sanctioned if “an evident and more moderate course would [suffice].” Merely preserving government funds or balancing a budget has not justified impairment in one prominent case.¹⁰⁶ Rather, it was held, modifications should be with respect to a pension fund’s “preservation or protection or the advancement of the ability of the employee to meet its pension obligations.”¹⁰⁷

Most state courts that have found contract impairments unconstitutional have made their decisions because of patent unfairness. That is particularly the case when modifications are sought to retiree benefits.¹⁰⁸ Unfairness necessarily is judged on a case-by-case basis, so a hard general rule is difficult to determine. It is also difficult to derive a general rule about what the various courts that have found a contract to exist actually consider the contract to be. For example, Massachusetts has recognized contractual protections for its state pension systems, but its Supreme Judicial Court has said that the contract is best understood “in a special, somewhat relaxed sense ... as meaning that the retirement has generated material expectations ... and these expectations should in substance be respected.”¹⁰⁹ By contrast, New York and Illinois have applied contract law principles very strictly.

In states that do not adhere to the strict contract theory, pensions are considered to be matters of policy that inherently are subject to revision. Courts in those states register concern that the essential powers of their respective legislatures not be unduly restricted. New Jersey is a prominent example.¹¹⁰

Many of the assumptions that fueled previous political and judicial decisions have changed, are weakened, or are wrong. Theories that underlay pension statutes and guided judicial thinking may no longer be valid and old arguments are losing power.

In the absence of a contract, some pension law challenges rely on constitutional “takings” provisions that protect a person’s property from being taken without just compensation. Such challenges rarely have been successful.

Finally, state constitutions are subject to change by the voters, and state constitutional amendments may allow modifications to pension contracts in a manner that passes U.S. Constitution muster. An amendment to the California constitution that would sanction changes to unaccrued benefits of current workers recently has been proposed.

Possible Legislative Change

The increased attention on public pension funding and jurisprudence, mostly since 2008, including insightful academic analyses, provides clues into the art of the possible and how changes desired by policymakers may be achieved. Many of the assumptions that fueled previous political and judicial decisions have changed, are weakened, or are wrong. Theories that underlay pension statutes and guided judicial thinking may no longer be valid and old arguments are losing power. Courts do not change, but judges do. The same is true of legislatures. Previous decisions may be revisited, especially as political forces realign.

Among the primary reasons that legislative efforts to address pension underfunding are misdirected and ineffective are the constitutional and legal protections afforded pension rights and the political power of those that resist change. Another reason is the perceived inability of states to enforce enhanced funding regimes stemming from the legal principle that the fundamental prerogative of legislatures is to make policy (and not contracts) so that one legislature cannot bind a subsequent one.

With respect to constitutional and legal protections stemming from the prevailing view that public pensions are a contract, the law in many states is that the pension contract begins at the date of hire. Accordingly, other than at the narrow margins, state legislatures do not affect pension benefits of current employees (or retirees). Those legislatures that have promulgated laws to curtail benefits of current employees find their efforts challenged in litigation. But the assumptions underlying these legal conclusions may be changing and may be wrong, especially as legal scrutiny continues to be applied and focused.

One avenue of change that affects current employees and retirees may be employing choice as contractual consideration (as something of value in the contract). Current employees (and retirees) could choose to retain their current plans or opt into a new one, such as a defined contribution plan that offers portability, requires greater contributions, or requires employees to share in investment risk. If the choice is genuine and freely made, courts may determine that there is adequate consideration supporting the contractual modification.

Another question is whether it is appropriate to consider pension obligations to be the equivalent of municipal debt and, as a corollary, whether pension debt can be restructured in bankruptcy. In the San Bernardino and Stockton, California, bankruptcy matters, other creditors have asserted that CalPERS is a general creditor, just like holders of pension obligation bonds (and other general obligation debt), which were defaulted. CalPERS counters that it is a trustee holding deferred compensation. The issue is not resolved. In Detroit, the Bankruptcy Court found that both pension beneficiaries and general obligation debt holders are subject to impairment. Certainly, pension liabilities are not fixed, unlike bonds or other debt instruments. Pension contribution obligations vary with the market value of assets, inflation, amortization periods, employee pay, et al., so equating pension with debt legislatively would be difficult to achieve.

In some states, workers and retirees are learning that legal protection of pension benefits is not sufficient protection, if there is insufficient money in pension funds. This is particularly germane now because when workers and retirees face legislative changes that reduce expected benefits, they may seek in return greater security for benefits or other forms of compensation. What can be done to ensure that governments contribute the necessary funds?

Possible Jurisprudential Change

Judicial decisions that could be most likely to change are those that have found an implied pension contract without a close examination of legislative intent. The United States Supreme Court has never found there to be a pension contract.¹¹¹ In *Nat'l RR. Passenger Corp. v. Atchison, Topeka & Santa Fe Ry. Co.*, 470 U.S. 451 (1988), the court said that

For many decades, this court has maintained that absent some clear indication that the legislature intends to bind itself contractually, the presumption is that "a law is not intended to create private contractual or vested rights but merely declares a policy to be pursued until the legislature shall ordain otherwise. (at 465-466)

It is conceivable that a pension litigation challenge could reach the Supreme Court, perhaps through a Chapter 9 U.S. Bankruptcy Court or with respect to an impairment claim brought in a federal court. In the Chapter 9 bankruptcy of Stockton, California, Judge Klein noted that the Impairment of Contracts clause of the U.S. Constitution applies to states and does not prevent the U.S. Congress from impairing contracts. He observed that bankruptcy is all about impairing contracts.¹¹² Judge Rhodes in Detroit argued in the same vein.¹¹³

Fundamental Value

U.S. society long ago adopted a fundamental value that public workers are entitled to a reliable measure of retirement security in exchange for their service. That societal value is considered a core promise that governments are obliged to meet. In many states the core promise has been expanded by political forces and aberrant economic circumstances so that the general understanding of the core promise in many states has become skewed by faulty assumptions and flawed financial practices, which have led to adverse, unforeseen consequences that we no longer can afford to ignore and perpetuate. It is imperative that the core pension promise to public employees be identified and kept. Like a fundamental truth, however, a core promise of a substantial pension can have more than one manifestation and be considered in changing contexts. Even where plans and governments are deeply stressed, policymakers should seek to define, preserve, and protect the core promise of retirement security.

Finally, any changes to pension benefits should be coupled with changes to make core benefits more secure: commitments to pay actuarially determined contributions, and to disclose and moderate the consequences of investment risk.

A Federal Role Is in the National Interest

Retirement security is a priority concern of the national government, as evidenced by the Social Security and Medicare programs. In many states, government employees, particularly teachers, do not participate in Social Security yet their benefits, which are not portable, are seldom higher than those of employees who also are covered by Social Security. In those states, and in all states where the ability to provide the core promise of retirement security is jeopardized by the serious unfunded status of their pension systems and inadequate means to correct rather than compound inadequacy, national objectives may fail.

More broadly, there is also a national interest in much of what states and localities do, whether for federal programs such as Medicaid, or for investments and services that can have benefits that extend beyond state borders, such as infrastructure and education. If these state and local government activities are crowded out by sharp and sudden increases in retirement contributions, then the national interest suffers.

Thus, a federal role is appropriate in addressing the problems caused by failed state and local pension systems and in encouraging and establishing standards and rules of the road to help prevent future failures. The federal government faces constraints on its ability to be involved, but also has many potential carrots and sticks.

One large constraint is the tradition of respect for state sovereignty. More than thirty years ago the Advisory Commission on Intergovernmental Relations stated, "The Commission opposes all forms of federal regulation of state and local retirement systems

because such regulation represents an unjustifiable and undesirable intrusion into the sovereignty of state and local governments in the fundamental area of personnel and their compensation. Even mild forms of federal regulation are rejected because they can be expected to lead to more extensive and undesirable intrusion in the future.”¹¹⁴ In the intervening three decades, state and local retirement systems have grown dramatically, many have become terribly underfunded, and have taken on increasing risk, and the moral hazards of their funding arrangements have become more clear. They risk intruding on the national interest. The ACIR argument no longer holds.

The federal government cannot require states to do much without legislation. It does not make or oversee state accounting standards: The Securities and Exchange Commission has no power over the Governmental Accounting Standards Board, even though it does have authority to establish private sector accounting standards and oversees GASB’s private sector counterpart, the Financial Accounting Standards Board.¹¹⁵ It does not establish or oversee actuarial standards. Under the Tower Amendment, it cannot directly control disclosure by governments in the municipal bond market, although it does have influence through other parties and through its antifraud power. It cannot compel governments to make contributions. Some of these constraints could be removed by federal legislation.

Federal legislators, analysts, and others have proposed enhanced federal roles. One economist has proposed that the federal government allow states to bond out unfunded pension liabilities, with a federal interest subsidy, coupled with a requirement that new employees be enrolled in defined contribution plans and, where not already the case, in Social Security.¹¹⁶ The former mayor of Los Angeles has proposed that states be allowed to bond out unfunded liabilities, and pay premiums for a federal insurance guarantee.¹¹⁷ Proposed Congressional legislation would make tax exemption for new municipal bonds contingent on greater disclosure of liabilities and the use of a risk-free discount rate (the Public Employee Pension Transparency Act).¹¹⁸ A former comptroller general has suggested it might be possible to give the Internal Revenue Service authority to eliminate the entity-level tax exemption of public pension funds if they do not meet certain disclosure requirements.¹¹⁹

There are many ways in which the federal government might establish rules and incentives to strengthen public sector benefit plans. Some might have their intended effects and others might have unintended effects. These proposals deserve careful attention and study. It is clear that, absent new rules and incentives, public pension plans are likely to get into deeper trouble in the future. It is also clear that governments themselves are unlikely to develop or abide by these rules, and that standards-setting bodies are unlikely to establish adequate standards and, even if they do,

they are unlikely to have any ability to enforce them. That leaves the federal government.

Conclusions and Recommendations

We have examined major flaws in the system of retirement security for state and local government workers:

- Pension liabilities and annual benefit costs are nearly universally underestimated by discounting with an assumed rate of investment return, rather than a discount rate reflecting the risk of the benefit payments.
- Pension accounting and funding standards and practices encourage investing in risky assets to reach for yield and, given the poor performance of investment returns since early 2000, fund managers are increasingly taking on additional risks.
- Workers, retirees, service beneficiaries, and taxpayers ultimately bear this risk
- These risks are poorly disclosed and understood.
- The potential consequences of these risks are far greater now than they were three or even two decades ago.
- Governments are not sufficiently disciplined to make adequate contributions.
- Pension accounting and funding standards and practices allow plan sponsors to avoid making adequate annual payments, thereby pushing significant cost onto future generations.

If public sector defined benefit plans are to be successful over the long run, these flaws must be fixed by removing bad incentives, increasing transparency, and imposing discipline. We recommend the following changes.

Pension Funds and Governments Should Value Liabilities and Expenses With a Risk-Free Rate, for Financial Reporting Purposes

Pension funds and governments should value liabilities and calculate costs of benefits, for financial reporting purposes, using a discount rate reflecting the risk that the obligations will not be paid. Funds also should disclose projected cash flows used to calculate liabilities so that they can be discounted at alternative rates. As a practical matter, in most cases the appropriate discount rate will be close to a risk free rate (or set of rates from different points on the yield curve). There are some important considerations involved in determining precisely which rate to use, in particular whether the rate should be taxable (yes), whether it should have a premium for liquidity (no), and whether it should be inflation-adjusted or not. This last question is not as straightforward — pension benefits are protected to differing degrees from inflation. A pragmatic choice that would get most of the desired result

would be to use a nominal rate.¹²⁰ Another pragmatic choice would be to base the discount rate on a high-quality municipal bond rate.

The rate generally should be risk free even though some pension benefits are succumbing to legal attack. It should reflect the fact that, when promised, pension benefits are expected to be and should be honored by governments. The rate definitely should not vary with the creditworthiness of the borrower. For example, it should not reflect the borrowing costs of the governments in question. Otherwise, it will create the perverse result that the governments in the worst financial trouble (quite possibly because of pension problems) would have the lowest reported pension liabilities, all else equal. (If the pension fund discount rate is based on the rates at which the government can borrow, then governments in financial trouble, thereby paying higher rates to borrow, will have lower reported pension liabilities.)

Even though separate calculation of pension liabilities and benefit costs in this manner are not required to be included in Comprehensive Annual Reports (CAFRs), they should be. Standards organizations — GASB and the Actuarial Standards Board in particular — should revisit their current standards and develop improved guidelines for pension systems and governments.

But in the interim, governments and pension systems and governments should do this on their own initiative.

Discounting at risk-free rates is likely to result in at least a \$2 trillion increase in reported liabilities for state and local governments in the United States.¹²¹ The estimate of annual pension expense — what governments would have to pay if they were to fully fund pensions without taking investment risk — is likely to increase by more than \$100 billion.

This change would not be a funding requirement; rather it would be disclosure of pertinent information. This is as it should be: governments, taxpayers, and others should know the full cost of promises that have been made, and what it could take to fund those promises without risk. Full disclosure could be the basis of political support and a predicate for legislative changes.

Pension Funds Need to Disclose More Fully the Consequences of Investment Risk

Pension funds are taking considerable investment risk that others bear. This risk must be disclosed far more fully. Pension funds need to disclose the potential consequences of investment risk not only for their funded status, but also for the contributions that participating governments may have to make. When investment returns fall short, they can require very large increases in contributions, and governments make these contributions if they are to keep their side of the bargain. But large increases in required contributions invariably come when governments are least able to afford them, and crowd out other services and investments of government, or require tax increases. And they erode public

support for public sector pension benefits, and for the public sector workforce.

The Pension Committee of the Actuarial Standards Board is headed in the right direction with its current discussion draft of actuarial standards that explores whether actuaries should be required to assess risk more rigorously. The Committee and, ultimately, the Actuarial Standards Board should develop standards in this area, and those standards should address the consequences of risk for contributions as well as for plan assets and funded status. Other professional organizations of actuaries and plan administrators should contribute to this effort.

Until then, pension funds and their sponsoring governments should take the lead and disclose the potential consequences of investment risk, on their own initiative.

There Needs to be External Downward Pressure on Investment Risk

No matter how professional and well-intended pension fund boards are, and no matter how well they disclose investment risks, current and future stakeholders in government will bear the risk that pension funds take. These stakeholders are not at the table when pension funds establish their risk tolerance. Because public pension funds have approximately two-thirds of their assets in equity-like investments, have become increasingly large, and have increasingly maturing memberships, the potential consequences of this risk are far greater now than in the past. There must be external pressure to moderate these risks.

What is also needed is an effort to dampen incentives for risk taking. Disclosure will help, but governments should develop formal statements of the contribution risk that they are willing to bear, and pension funds should consider these statements explicitly as they develop their investment policy statements and asset allocation policies.

Governments Must Keep Their End of the Bargain and Pay Realistic Actuarially Determined Contributions

Any rules used to estimate liabilities and to fund liabilities are likely to be imperfect and controversial. But the one thing that governments should not do is ignore all rules, and fund benefits on an ad hoc basis. The surest way to turn pension underfunding into a crisis is underpay liabilities. This has happened in Illinois, New Jersey, Rhode Island, Pennsylvania, and several other states, and is happening now to CalSTRS in California. It has reached the point for CalSTRS where governments would have to pay an additional \$4.5 billion annually, rising yearly, to achieve full funding under actuarial standards in thirty years; the required increase using economic measures would be far greater. The CalSTRS actuary projects that, absent change, the fund will be depleted by 2044.¹²² Governments should fund actuarially determined contributions.

This is compounded by rules and practices by some funds and governments that allow inordinately long amortization periods for investment losses and actuarial losses, and by extraordinary borrowing mechanisms that allow governments to push the consequences of recent losses far into the future. Governments and pension funds should sharply limit amortization periods, in general not extending them beyond the remaining working life of current membership. The Actuarial Standards Board should examine standards in this area very carefully, with an eye toward shortening amortization periods.

State governments have the legal authority to require their local governments to make contributions, and can establish enforcement mechanisms, such as the withholding of state aid, to ensure that they do so. Several states have done so, as illustrated earlier in the report. Other states should do so, too.

It is much harder for states to bind their own hands, and impose discipline on themselves. Still, a formal legal commitment to funding required contributions backed with a potential remedy, as New Jersey and Illinois have adopted, and dedicated revenue sources as several states have provided for local government contributions, hold promise.

If governments and pension funds will not do this on their own, the federal government should consider creating incentives to encourage this.

There Is a National Interest, and a Potential Federal Role, in Ensuring Proper Disclosure and Adequate Contributions

Because there is a national interest in retirement security and in much of what states and localities do, which can be crowded out by sharp increases in retirement contributions, there is a potential federal role in encouraging or establishing rules to help address the problems caused by failed state and local pension systems and prevent future failures.

The federal government should explore options for regulatory action by the Municipal Securities Rulemaking Board, the Securities and Exchange Commission, and Congressional oversight to enhance reporting and transparency. Congressional action in respect of a variant of the previously abandoned Public Employee Retirement Income Security Act (PERISA) also could be a vehicle of federal attention. Other legislative measures might be necessary. We do not advocate federal regulatory attention by the U.S. Bankruptcy Courts (which could introduce confusing, conflicting rulings and broad uncertainty), nor do we advocate additional federal funding to the states for underfunded pensions.

If states and standards-setting bodies do not go far enough on their own, the federal government should consider more intrusive action to monitor and police state and local government retirement systems.

Endnotes

- 1 Monica Davey, Bill Vlastic, and Mary Williams Walsh, “Detroit Ruling on Bankruptcy Lifts Pension Protections,” *The New York Times*, December 3, 2013, http://www.nytimes.com/2013/12/04/us/detroit-bankruptcy-ruling.html?_r=0.
- 2 U.S. Bureau of the Census, 2011 Annual Survey of Public Pensions, <http://www.census.gov/govs/retire/>.
- 3 U.S. Bureau of Labor Statistics, Current Employment Statistics, <http://www.bls.gov/ces/>.
- 4 Dawn Nuschler, Alison M. Shelton, and John J. Topoleski, *Social Security: Mandatory Coverage of New State and Local Government Employees*, CRS Report for Congress (Washington, DC: Congressional Research Service, July 25, 2011), <http://www.nasra.org/resources/CRS%202011%20Report.pdf>.
- 5 Richard Ravitch and Paul Volcker, *Full Report* (New York, NY: State Budget Crisis Task Force, July 2012), <http://www.statebudgetcrisis.org/wpcms/report-1>.
- 6 In Robert Novy-Marx and Joshua D. Rauh, “The Liabilities and Risks of State-Sponsored Pension Plans,” *Journal of Economic Perspectives* 23, 4 (Fall 2009): 191–210, http://www.stanford.edu/~rauh/research/JEP_Fall2009.pdf, the authors estimated that liabilities discounted using Treasury rates were approximately \$2.2 trillion higher than amounts reported based on earnings-assumption discounting (Table 2, p. 19). Interest rates have since fallen significantly, and so discounted benefits would be higher now. In Alicia H Munnell et al., “Valuing Liabilities in State and Local Plans” Boston, MA: Centers for Retirement Research at Boston College, June 2010), http://crr.bc.edu/wp-content/uploads/2010/06/slp_11-508.pdf, the authors estimated that liabilities of major plans would be about \$800 million higher than reported if a 5 percent discount rate were used, and \$1.3 trillion higher if a 4 percent discount rate were used. More recently Moody’s re-estimated pension liabilities of major state and local government systems and estimated unfunded liabilities of the plans they examined were about \$1.9 trillion. The Task Force estimates that Moody’s examined approximately 85 percent of the universe. In addition, the bond index Moody’s used to establish the discount rate is now lower. Adjusting for these two factors, the Task Force estimates that underfunding for the total universe, using the Moody’s methodology but at recent interest rates, would be approximately \$3.5 trillion. (For Moody’s estimates, see Moody’s Investors Service, *Adjustments to US State and Local Government Reported Pension Data* (New York, NY: Moody’s Investors Services, April 17, 2013, <http://gfoa.org/downloads/MoodysAdjustmentsApril2013.pdf>.) The estimates developed by economists using lower-risk discount rates usually use a slightly narrower definition of liability, known as the accumulated benefit obligation, than the projected benefit obligation typically used by actuaries, but the difference in discount rates more than makes up for the narrower definition.
- 7 Unfunded liabilities for major retirement systems tracked by the National Association of State Retirement Administrators Public Fund Survey (<http://www.publicfundsurvey.org/publicfundsurvey/index.htm>) were \$843 billion, per data accessed February 19, 2013. Data from the Center for Retirement Research’s Public Plans Database generally show similar results (<http://crr.bc.edu/data/public-plans-database/>). The \$2.616 trillion market value of assets in the NASRA Public Fund Survey was 86.4 percent of the \$3.027 trillion total assets for all state and local government retirement systems at the end of 2011, as reported by the U.S. Bureau of the Census (http://www2.census.gov/govs/retire/2011_ret01.xls). Applying the same proportion to unfunded liabilities suggests that aggregate underfunding of all systems likely approaches \$1 trillion on an actuarial basis.
- 8 See details in Ravitch and Volcker, *Full Report*
- 9 Technically, they look to rates on securities that have risk similar to the risk of the payments being valued.
- 10 Harry Markowitz, “Portfolio Selection,” *The Journal of Finance* 7, 1 (March 1952): 77–91, http://www.math.ust.hk/~maykwok/courses/ma362/07F/markowitz_JF.pdf.
- 11 $\$1,000/(1.03^{15})=\642 , and $\$1,000/(1.08^{15})=\315 .
- 12 For example, see Jeffrey R. Brown and David W. Wilcox, “Discounting State and Local Pension Liabilities,” *American Economic Review* 99, 2 (2009): 538–42; George Pennacchi and Mahdi Rastad, “Portfolio Allocation for Public Pension Funds,” *Journal of Pension Economics and Finance* 10, no. 02 (2011): 221–45; Donald L. Kohn, “The Economic Outlook: Speech at the National Conference on Public Employee Retirement Systems Annual Conference” (Washington, DC: Federal Reserve Board, May 20, 2008), <http://www.federalreserve.gov/newsevents/speech/kohn20080520a.htm>; Munnell et al., “Valuing

- Liabilities in State and Local Pensions”]; and Frank Russek, *The Underfunding of State and Local Pension Plans*, Economic and Budget Issue Brief (Washington, DC: Congressional Budget Office, May 2011), <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/120xx/doc12084/05-04-pensions.pdf>. Because pension benefits have strong legal protections in most states, many observers believe the “risk” that pensions will not be paid is low, although recent pension changes have made it clear that benefits sometimes can be reduced. In the current interest-rate environment, low-risk interest rates are far lower than retirement system earnings assumptions, and liabilities calculated with these rates are much higher than actuarial liabilities. There is no widespread agreement on the “right” low-risk discount rate to use, however, and relatively small changes in discount rates can lead to relatively large differences in estimated liabilities.
- 13 Those standards are promulgated in Governmental Accounting Standards Board (GASB) Statement No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*, <http://www.gasb.org/st/summary/gstsm25.html>; Statement No. 27, *Accounting for Pensions by State and Local Governmental Employers*, <http://www.gasb.org/st/summary/gstsm27.html>; and Statement No. 50, *Pension Disclosures – An Amendment of GASB Statements No. 25 and No. 27*, <http://www.gasb.org/st/summary/gstsm50.html>.
 - 14 For brief histories of actuarial discount rates, see M. Barton Waring, *Pension Finance* (Hoboken, NJ: John Wiley & Sons, Inc., 2012): 21-4, Alicia H. Munnell, *State and Local Pensions: What Now?* (Washington, DC: Brookings Institution Press, 2012): 54-7, and C. D. Daykin, *Actuaries and Discount Rates: A Discussion* (London, UK: Institute and Faculty of Actuaries, May 2010), <http://www.actuaries.org.uk/research-and-resources/documents/actuaries-and-discount-rates-discussion>.
 - 15 The actuarial standards of primary relevance here are set out in *Actuarial Standard of Practice No. 4: Measuring Pension Obligations and Determining Pension Plan Costs or Contributions, Revised Edition* (Washington, DC: Actuarial Standards Board, September 2007), http://www.actuarialstandardsboard.org/pdf/asops/asop004_107.pdf, and *Actuarial Standard of Practice No. 27: Selection of Economic Assumptions for Measuring Pension Obligations, Revised Edition* (Washington, DC: Actuarial Standards Board, September 2007), http://www.actuarialstandardsboard.org/pdf/asops/asop027_109.pdf.
 - 16 Robert Novy-Marx, *Logical Implications of GASB’s Methodology for Valuing Pension Liabilities* (Cambridge, MA: National Bureau of Economic Research, November 2011), <http://www.nber.org/papers/w17613>.
 - 17 Attributed to Martin Taylor, chairman of the trustee board of WH Smith, a British retailer, in “Actuaries and the Pensions Crunch: When the Spinning Stops,” *The Economist*, January 26, 2006, http://www.economist.com/node/5436947?story_id=5436947.
 - 18 *Financial Accounts of the United States: Flow of Funds, Balance Sheets, and Integrated Macroeconomic Accounts – Third Quarter 2013* (Washington, DC: Federal Reserve Board, December 9, 2013), <http://www.federalreserve.gov/releases/z1/current/z1.pdf>.
 - 19 GASB will take a bifurcated approach: If assets plus contributions and earnings at the assumed earnings rate are projected to be sufficient to cover benefit payments in all future years, then the government’s liability can be discounted using the expected investment return. But if the plan is so poorly funded that it is projected to reach a “cross-over” point after which assets and inflows will be insufficient to cover benefits, then it must, in effect, discount payments after that date using a high quality municipal bond rate. To implement this, the employer will use a single blended rate. Because the municipal bond rate generally will be lower than the expected return, the blended rate will be lower, and estimated liabilities for poorly funded plans will rise, while estimated liabilities for other plans will not.
 - 20 Moody’s Investors Service, *Request for Comment: Adjustments to US State and Local Government Reported Pension Data* (New York, NY: Moody’s Investors Service, July 2, 2012), <http://www.gfoa.org/downloads/GFOA2012Moodyspensionreport.pdf>.
 - 21 For a good summary of the new standards, see Paul Zorn and James Rizzo, *The GASB’s New Pension Accounting and Financial Reporting Standards*, *GRS Insight* (Southfield, MI: Gabriel Roeder Smith & Company, October 2012). For a critique and analysis, see Chapter 3 of Munnell, *State and Local Pensions*.
 - 22 Caitlin Devitt, “Detroit’s Proposed \$1B 2014 Budget Leaves Deficit Unsolved” *Bond Buyer*, April 12, 2013. In fact, the Emergency Financial Manager reduced the discount rate by only one percentage point. If he had reduced it to a risk-free rate, unfunded liabilities would have been shown to be even higher.

- 23 Cory Koedel, Shawn Ni, and Michael Podgursky, *Who Benefits from Pension Enhancements?*, Working Paper, (Columbia, MO: University of Missouri, June 2012), http://economics.missouri.edu/working-papers/2012/WP1207_koedel.pdf.
- 24 Munnell, *State and Local Pensions: What Now?*, p. 65.
- 25 The former legislator, Tom McClintock, voted no. Sylvester J. Schieber, "Political Economy of Public Sector Retirement Plans," *Journal of Pension Economics and Finance* 10, 2 (April 2011): 269–90.
- 26 Koedel, Ni, and Podgursky, *Who Benefits from Pension Enhancements?*
- 27 Schieber, "Political Economy of Public Sector Retirement Plans."
- 28 Ibid.
- 29 Robert L. Clark, Lee A. Craig, and John Sabelhaus, *State and Local Retirement Plans in the United States* (Northampton, MA: Edward Elgar Publishing, 2011), as reported in Jeffrey R. Brown, Robert Clark, and Joshua D. Rauh, "The Economics of State and Local Pensions," *Journal of Pension Economics and Finance* 10, no. 02 (2011): 161–172.
- 30 Munnell, *State and Local Pensions*.
- 31 In most states pensions are a function of legislation and are not a permissible subject of collective bargaining.
- 32 For example, see "Union Actuary Says UC Overstates Pension Costs." *UC Employees*, May 14, 2013, <http://www.afscme3299.org/2013/05/14/union-actuary-says-uc-overstates-pension-costs/>. Also see, Steven Kreisberg, "Pension Basics," AFSCME, December 2010, www.afscmestaff.org/PensionBasics.ppt.
- 33 See, for example, "CalPERS to Phase in Employer Impact of Discount Rate Reduction," Press Release, April 18, 2012, Accessed June 15, 2012, <http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-archive/pr-2012/april/discount-rate-reduction.xml>.
- 34 Task Force analysis of data in Moody's Investors Service, *Adjustments to US State and Local Government Reported Pension Data*.
- 35 Moody's Investors Service, *Request for Comment: Adjustments to US State and Local Government Reported Pension Data*; see p. 8.
- 36 Other institutional features also may encourage risk-taking. One recent academic paper (Pennacchi and Rastad, "Portfolio Allocation for Public Pension Funds") found that "public pension funds' boards and staffs tend to allocate assets based on the performance of peer pension funds rather than with the goal of matching the funding needs of the plan's liabilities. That same paper also found that pension funds take on greater overall risk following periods of investment underperformance, consistent with the idea of trying to recoup losses or underperformance. They also found that plans with higher discount rates tend to choose riskier portfolios. In other words, "a poorly performing pension fund reduces the hedging of its liabilities and gambles by choosing a riskier portfolio more typical of its peers."
- 37 Corporate plans in the U.S. face a variety of incentives that have changed over time, some of which may encourage investment in risky assets and others of which may not, but none of these incentives is as flexible as the nearly unfettered flexibility that U.S. public plans have to choose their discount rate. See Aleksandar Andonov, Rob Bauer, and Martin Cremers, *Pension Fund Asset Allocation and Liability Discount Rates: Camouflage and Reckless Risk Taking by U.S. Public Plans?*, May 2012. p. 10, <https://connect.innovateuk.org/documents/3149548/3796284/Andonov+Bauer+and+Cremers+-+Pension+Fund+Asset+Allocation+and+Liability+Discount+Rates.pdf/d7788d95-6654-42e2-bb28-4f527c0a2cc1> and the references discussed within. The Canadian and European funds analyzed in this study did not have much flexibility in choosing discount rates.
- 38 Ibid.
- 39 Nancy Mohan and Ting Zhang, *An Analysis of Risk-Taking Behavior for Public Defined Benefit Pension Plans*, Working Paper (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2012).
- 40 This conclusion was in the associated policy paper: Nancy Mohan and Ting Zhang, *Public Pension Crisis and Investment Risk Taking: Underfunding, Fiscal Constraints, Public Accounting, and Policy Implications*, Policy Paper (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, February 1, 2012), http://research.upjohn.org/cgi/viewcontent.cgi?article=1012&context=up_policypapers.

- 41 International Monetary Fund, *Global Financial Stability Report: Old Risks, New Challenges*, (Washington, DC: International Monetary Fund, April 2013), <http://www.imf.org/External/Pubs/FT/GFSR/2013/01/pdf/text.pdf>. Per the IMF, “Alternative investments cover a broad range of investment strategies and structures that fall outside the boundaries of traditional asset categories of equities, bonds, and cash, and include, for instance, private equity, hedge funds, and financial derivatives.”
- 42 Dean Baker, “The Financial Health of Public Pensions,” Center for Economic and Policy Research (CEPR) Blog,” May 3, 2013, <http://www.cepr.net/index.php/blogs/cepr-blog/today-the-financial-health-of-public-pensions>.
- 43 M. Barton Waring, *Pension Finance*.
- 44 If returns are not independent from year to year — if there is mean reversion or if returns are correlated over time in other ways, volatility could diminish more quickly, but likely not in a manner that would alter the conclusions here.
- 45 Joe Dear, “CalPERS Chief Investment Officer Total Fund Performance and Risk Report, Period Ending March 31, 2013,” May 2013, <http://www.calpers.ca.gov/eip-docs/about/committee-meetings/agendas/invest/201305/item06a-01.pdf>. The assumed standard deviation in this report was 12.96 percent, and the expected return shown on a graph was 7.38 percent. The official CalPERS earnings assumption is 7.5 percent.
- 46 *Financial Accounts of the United States: Flow of Funds, Balance Sheets, and Integrated Macroeconomic Accounts – Third Quarter 2013*.
- 47 See Alan Milligan, “CalPERS Annual Review of Funding Levels and Risks as of June 30, 2012 (Report for Finance and Administration Committee of the Board of Trustees of the California Public Employees’ Retirement System , March 18, 2013, <http://www.calpers.ca.gov/eip-docs/about/pubs/employer/2012-report.pdf>.
- 48 Assuming investment returns are normally distributed.
- 49 See U.S. Census Bureau, “Table 1. State and Local Government Finances by Level of Government and by State: 2010-11,” <http://www2.census.gov/govs/local/11slsstab1a.xls>.
- 50 The Monte Carlo simulation model also assumes that the hypothetical pension system has benefits equal to contributions (no net cash flow, other than investment income); that investment returns are normally distributed and independent from year to year; and that any asset shortfalls or overages relative to the expected amounts are amortized over fifteen years as a level percentage of payroll that grows by 4 percent annually.
- 51 See U.S. Census Bureau, “Table 1. State and Local Government Finances by Level of Government and by State: 2010-11.”
- 52 Milligan, “CalPERS Annual Review of Funding Levels and Risks As of June 30, 2012.”
- 53 For discussion, see Munnell, *State and Local Pensions*.
- 54 Ravitch and Volcker, *Full Report*.
- 55 Richard Ravitch and Paul Volcker, *State Budget Crisis Task Force: New York Report* (New York, NY: State Budget Crisis Task Force, October 2012): 27-9.
- 56 Although governments are required to pay what is requested, the state has enacted and proposed legislation referred to as “amortization” or “smoothing” legislation, that allows the state and its local governments to stretch out contributions over time, in effect borrowing from the pension systems. Even so, the contribution increases are significant and have placed considerable stress on local governments.
- 57 See, for example, Munnell, *State and Local Pensions: What Now?*, pp. 119-20; also, Ravitch and Volcker, *Full Report*.
- 58 Task Force calculations based on actuarial valuations and projected contribution rates of the New York State and Local Retirement System.
- 59 Descriptions of retirement system changes below are based on Ron Snell, *State Pension Reform, 2009-2011* (Denver, CO and Washington, DC: National Conference of State Legislatures, March 2012), <http://www.ncsl.org/documents/employ/StatePensionReform2009-2011.pdf>; Ronald Snell, *Highlights of State Pension Reform in 2012* (Denver, CO and Washington, DC: National Conference of State Legislatures,

- July 2012), <http://www.ncsl.org/documents/employ/Highlights-Pension-Reform2012.pdf>, and press reports on pension reform in Ohio, which occurred after the 2012 NCSL report was published. Idaho's actuarial funded ratio is based on the Public Fund Survey, the National Association of State Retirement Administrators and the National Council on Teacher Retirement, February 2013, www.publicfundsurvey.org.
- 60 Under GASB Statement No. 25, *Financial Reporting for Defined Benefit Pension Plans and Note Disclosures for Defined Contribution Plans*. This will no longer be required under new standards but we expect most plans will estimate a similar concept.
- 61 In 2012 GASB promulgated new standards – GASB 67 (Financial Reporting for Pension Plans – An Amendment of GASB Statement No. 25) and 68 (Accounting and Financial Reporting for Pensions – An Amendment of GASB Statement No. 27) – to be effective in 2014. The new standards separate funding and accounting and also eliminate the Annual Required Contribution as a reported expense.
- 62 *The Widening Gap Update*, Issue Brief (Washington, DC: Pew Center on the States, June 2012), http://www.pewstates.org/uploadedFiles/PCS_Assets/2012/Pew_Pensions_Update.pdf.
- 63 Donald Boyd, “The State Budget Crisis Task Force” (presented at the Federal Reserve Bank of New York, Fiscal Breakfast Meeting, New York, NY, January 16, 2013). This analysis was based upon data in Chris Mier and Ann Kibler, *Tenth Annual Public Pension Funding Review* (Chicago, IL: Loop Capital Markets, September 2012). The underpayments in California were the result, primarily, of underpayments to the California Teachers Retirement System and the California Judges Retirement Fund; governments in California normally must, and do, make required payments to most funds in the California Public Employees Retirement System.
- 64 Richard Ravitch and Paul Volcker, *State Budget Crisis Task Force: Illinois Report* (New York, NY: State Budget Crisis Task Force, October 2012), <http://www.statebudgetcrisis.org/wpcms/wp-content/images/2012-10-12-Illinois-Report-Final-2.pdf>.
- 65 Ibid.
- 66 *Summary of Public Act 98-599 (Pension Reform)*, State Universities Retirement System of Illinois, December 20, 2013, <http://www.surs.com/pdfs/legal/Pension-Reform-Summary-SB1.pdf>.
- 67 Richard Ravitch and Paul Volcker, *State Budget Crisis Task Force: New Jersey Report* (New York, NY: State Budget Crisis Task Force, September 2012), <http://www.statebudgetcrisis.org/wpcms/wp-content/images/2012-10-22-New-Jersey-Report-Final.pdf>.
- 68 See Jarrett Renshaw, “Christie Administration Warns It Might Not Make Full Pension Payment in Future Years,” *The Star-Ledger*, Newark, NJ, May 15, 2013, http://www.nj.com/politics/index.ssf/2013/05/christie_administration_warns.html.
- 69 Munnell, *State and Local Pensions*.
- 70 See IMRF Online Manual Section 7 on Employer Contributions, January 2013, and Section 40 ILCS 5/7-171 of the Illinois Pension Code (<http://law.onecle.com/illinois/40ilcs5/7-171.html>).
- 71 *Illinois Municipal Retirement Fund* (Center for State & Local Government Excellence, 2011), http://slge.org/wp-content/uploads/2011/12/Funding-ratio-case-study_IL-Muni.pdf.
- 72 *McDermott v. Regan*, 82 N.Y.2d 354 (1993). In 1990, the state Legislature attempted to mandate that the state comptroller (sole trustee of the state's Common Retirement Fund) use an actuarial method known as projected unit credit (PUC) rather than the aggregate cost method then being used. The PUC method was less conservative and would result in near-term budgetary savings to the state. The state's highest court ruled that this would impair the benefits of the pension fund.
- 73 See State of New York, Update to Annual Information Statement (AIS), February 8, 2012, p. 25, <http://www.budget.ny.gov/pubs/archive/fy1112archive/enacted1112/AIS/AISUpdateFebruary2012.pdf>.
- 74 See Division of Local Government and School Accountability, New York State Department of Education, Memorandum to Chief Fiscal Officers, Subject: Pension Accounting and Reporting Changes,” September 2011, http://www.osc.state.ny.us/localgov/pubs/releases/2011_09pensionreportingchanges.pdf.
- 75 See Rhode Island Pension Study Committee, February 25, 2013 Meeting Minutes, http://www.muni-info.state.ri.us/documents/finances/Study_Commission_Pension/2013.02.25-Mtg/Minutes-Package-for-2-25-13-PSC-Meeting.pdf.

- 76 As many as thirteen other states have constitutional provisions relating to employer contributions, including Arizona, Maine, Montana, and Texas, but they do not appear to have enforcement mechanisms as clear-cut as that in Louisiana. Based on review of *NEA Issue Brief on Pension Protections in State Constitutions*, Issue Brief (Washington, DC: National Education Association, June 2004), <http://www.nea.org/assets/docs/PensionProtectionsinStateConstitutions04.pdf>, and of the spreadsheet “NASRAContributionspolicies.xlsx,” prepared by Keith Brainard, Research Director, National Association of State Retirement Administrators, and provided by Adam Levinson of Klausner, Kaufman, Jensen & Levinson by email dated May 6, 2013.
- 77 *Overview of Louisiana’s Unfunded Accrued Liability, Informational Report* (Baton Rouge, LA: Louisiana Legislative Auditor, May 20, 2011), [http://app1.la.state.la.us/PublicReports.nsf/0/BC4C09C444D8394F86257896005F5702/\\$FILE/0001F62E.pdf](http://app1.la.state.la.us/PublicReports.nsf/0/BC4C09C444D8394F86257896005F5702/$FILE/0001F62E.pdf).
- 78 Louisiana State Constitution Article X, §29, <http://legis.la.gov/lss/lss.asp?doc=206322>.
- 79 *Overview of Louisiana’s Unfunded Accrued Liability*.
- 80 Section 26, Chapter 78, New Jersey Laws of 2011.
- 81 According to email correspondence from Adam Levison, Klausner, Kaufman, Jensen & Levinson, May 15, 2013: A.R.S. §§ 12-119.01(B)(2)(supreme court fees); 12-120.31(D)(2) (court of appeals fees); 12-284.03(A)(6)(superior court fees); 22-281 ©(3) (justice of the peace fees); 41-178(6)(notary oaths, bonds, and certificates). (AL 5/15). Also, email correspondence from Keith Brainard, May 13, 2013.
- 82 Sections 175.101 and 185.08, Florida Statutes. Email from Adam Levinson, May 15, 2013.
- 83 Email correspondence, Keith Brainard, May 2013.
- 84 *Dedicated Revenue Sources for State Pension Funds*, Issue Brief (Chicago, IL: The Civic Federation, February 14, 2007), http://civicfed.org/sites/default/files/civicfed_240.pdf.
- 85 “Public Fund Survey,” accessed May 6, 2012, <http://www.publicfundsurvey.org/www/publicfundsurvey/actuarialfundinglevels.asp>.
- 86 Tongxuan (Stella) Yang and Olivia S. Mitchell, *Public Pension Governance, Funding, and Performance: A Longitudinal Appraisal*, Working Paper (Philadelphia, PA: Pension Research Council, 2005), <http://www.pensions-institute.org/workingpapers/WP2005-2.pdf>.
- 87 Quote by Robert C. North, Jr., Chief Actuary, New York City Retirement Systems, April 19, 2013.
- 88 The most recent GASB statements require analysis of the sensitivity of pension liabilities to changes in discount rates, and a GASB “Preliminary View” on Economic Condition Reporting proposed that governments include projections of pension contributions in their CAFRs. See *Preliminary Views of the Governmental Accounting Standards Board on major issues related to Economic Condition Reporting: Financial Projections*, No.13-3 (Washington, DC: Governmental Accounting Standard Board, November 29, 2011, <http://www.gasb.org/cs/BlobServer?blobkey=id&blobwhere=1175823466973&blobheader=application%2Fpdf&blobcol=urldata&blobtable=MungoBlobs> and http://www.gasb.org/cs/ContentServer?c=GASBContent_C&pagename=GASB%2FGASBContent_C%2FProjectPage&cid=1176156646154.
- 89 See *Considerations in Preparing Disclosure in Official Statements Regarding an Issuer’s Pension Funding Obligations (Public Defined Benefit Pension Plans)* (Washington, DC: National Association of Bond Lawyers, May 15, 2012), http://www.nabl.org/uploads/cms/documents/pension_funding_obligations_document_5-18-12_b.pdf; Josh Barro, *Unmasking Hidden Costs: Best Practices for Public Pension Transparency*, Civic Report, No. 63 (New York, NY: Manhattan Institute for Policy Research, February 2011), http://www.manhattan-institute.org/html/cr_63.htm; and Josh McGee, “Letter on Pension Transparency to The Honorable William A. Callegari Chairman, House Committee on Pensions Texas House of Representatives, From Josh McGee of the Laura and John Arnold Foundation,” March 1, 2013.
- 90 *Discussion Draft: Assessment and Disclosure of Risk Associated with Pension Obligations, Plan Costs, and Plan Contributions* (Washington, DC: Pension Committee of the Actuarial Standards Board, June 2012), http://www.actuarialstandardsboard.org/pdf/discussions/Risk%20Discussion%20Draft_June%202012.pdf
- 91 John H. Moore and Pension Practice Council of the American Academy of Actuaries, “Comments on the Risk-Related Discussion Draft of the Pension Committee of the Actuarial Standards Board,” October 1, 2012.

- 92 Rockefeller Institute analysis of *Financial Accounts of the United States: Flow of Funds, Balance Sheets, and Integrated Macroeconomic Accounts – Third Quarter 2013*.
- 93 This ignores what may be happening to other assets, which may be correlated with equities.
- 94 Task Force analysis of the U.S. Census Bureau, *State and Local Public-Employee Retirement System Survey*, <http://www.census.gov/econ/overview/go0700.html>. Similar trends, for a shorter time period, are evident in the “Public Fund Survey.”
- 95 The data in this section on net outflows are based on Task Force analysis of Census Bureau annual surveys of retirement systems.
- 96 Consider a pension fund that has net outflows equal to 4.5 percent of assets, with benefits and contributions both growing 7 percent annually (roughly consistent with recent experience). If it earns 4 percent on investments for five years, followed by 12 percent for five years, its assets at the end of ten years will be nearly 13 percent lower than if the returns come in the opposite order, even though annual average return is 7.9 percent either way. $[(1.04^{10} \times 1.12^{10}) - 1 = (1.12^{10} \times 1.04^{10}) - 1 = 7.93\%]$ If the fund earns 4 percent for ten years followed by ten years of 12 percent, its assets after twenty years would be 90 percent less than if returns had come in the opposite order. These calculations assume no change in contributions to amortize asset shortfalls in the early years. Amortization would narrow the difference between the two sequences of returns.
- 97 For example, the ten-year U.S. Treasury note had a yield of 6.03 percent on June 30, 2000, and a yield of 1.86 percent on April 5, 2013. The median investment return assumption for major public retirement plans was 8 percent for fiscal year 2001 (when the Public Fund Survey was established) and was 7.75 percent for fiscal year 2011 (the most recent compilation available). For historical Treasury yields, see <http://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield>. For historical investment return assumptions, see <http://www.publicfundsurvey.org/publicfundsurvey/summaryoffindings.html>.
- 98 For the ERISA treatment, see FAQs About Retirement Plans And ERISA (Washington, DC: U.S. Department of Labor), http://www.dol.gov/ebsa/faqs/faq_consumer_pension.html (“Defined benefit plans may change the rate at which you earn future benefits but cannot reduce the amount of benefits you have already accumulated.”)
- 99 Connecticut, Indiana, Maine, Minnesota, New Mexico, Ohio, Texas, and Wyoming do not.
- 100 Amy Monahan, “Public Pension Plan Reform: The Legal Framework,” *Education, Finance & Policy* 5 (2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1573864.
- 101 Recently it has been argued in Illinois that the guarantee is not the state’s but that of the Pension Funds.
- 102 Amy B. Monahan, “Statutes as Contracts? The California Rule and Its Impact on Public Pension Reform,” *Iowa Law Review* 97 (2011): 1029-83, http://www.uiowa.edu/~ilr/issues/ILR_97-4_Monahan.pdf. The twelve other states are Alaska, Colorado, Idaho, Kansas, Massachusetts, Nebraska, Nevada, Oklahoma, Oregon, Pennsylvania, Vermont, and Washington (p. 1071).
- 103 An “executory contract” is one that has not yet been fully performed or executed — in this context, in some states the pension contract is one where rights to benefits are earned as services are performed.
- 104 Monahan, “Public Pension Plan Reform: The Legal Framework.”
- 105 *U.S. Trust Co. v. New Jersey*, 431 U.S. 1, cited and discussed in Monahan at 16.
- 106 Monahan, “Public Pension Plan Reform: The Legal Framework.”
- 107 *Claypool v. Wilson*, 4 Cal. App. 4th at 666 quoting *Betts v. Bd. Of Admin.*, 21 Cal. 3rd 859 (1978).
- 108 Stuart Buck, *Legal Obstacles to State Pension Reform*, accessed July 28, 2013. http://www.aefpweb.org/sites/default/files/webform/Stuart_Buck_Legal_Obstacles_to_Pension_Reform.pdf.
- 109 Opinion of the Justices 364 Mass. 897, 861-862. See *Ibid*.
- 110 *National RR Passenger Corp. v. Atchison, Topeka & Santa Fe Ry*, 470 US 451 at 456-466 (1985) and cases cited in *Ibid*.
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- 112 Alison Frankel, "On the CaseBlogger" *Thomson Reuters News & Insight*, April 3, 2013, Tweet, <http://muckrack.com/AlisonFrankel/statuses/319560209066496000>.
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- 114 *State and Local Pension Systems – Federal Regulatory Issues* (Washington, DC: Advisory Commission on Intergovernmental Relations, December 1980), <http://www.library.unt.edu/gpo/acir/Reports/policy/A-71.pdf>.
- 115 See Facts About FASB, <http://www.fasb.org/facts/>.
- 116 The Editors, "Can States Fix Their Pension Problems?" *The New York Times* Room for Debate, May 20, 2010, <http://roomfordebate.blogs.nytimes.com/2010/05/20/can-states-fix-their-pension-problems/>.
- 117 Richard J. Riordan and Tim Rutten, "A Plan to Avert the Pension Crisis," *The New York Times*, August 4, 2013, <http://www.nytimes.com/2013/08/05/opinion/a-plan-to-avert-the-pension-crisis.html?emc=eta1>.
- 118 "The Public Employee Pension Transparency Act (PEPTA)," Web site of Congressman Devin Nunes, <http://nunes.house.gov/legislation/pepta.htm>, accessed August 6, 2013.
- 119 Conversation with David Walker, April 19, 2013.
- 120 For discussion of some of the details involved in selecting appropriate discount rates see Munnell, *State and Local Pensions: What Now?*, p. 261. Also see, Robert Novy-Marx and Joshua Rauh, "Public Pension Promises: How Big Are They and What Are They Worth?," *The Journal of Finance* 66, 4 (2011): 1211–1249.
- 121 For example, when Moody's "rediscounted" liabilities using a high-grade long-term taxable bond index with a rate of approximately 5.5 percent, and it drove estimated liabilities for their share of the universe upward by approximately \$1 trillion.
- 122 Addressing CalSTRS' Long-Term Funding Needs (California Legislative Analyst's Office, March 20, 2013).

