Working Paper

State and Local Pensions: The Case for Fundamental Reforms

UNITED STATES DEPARTMENT OF LABOR

OFFICE OF THE ASSISTANT SECRETARY FOR POLICY

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The crisis facing state and local employee pensions has been a topic of conversation for years. This working paper, "State and Local Pensions: The Case for Fundamental Reforms," addresses the origins and nature of the widespread underfunding of state and local pension systems and its impact on the retirement security of the nation's public workforce.

The U.S. Department of Labor oversees many aspects of private-sector retirement plans including the investment of retirement plan assets, the conduct of plan managers, the reporting and disclosure of plan information, the plan's fiduciary duties that participants rely on, and the benefits that retirees receive. However, the Department's enforcement and monitoring oversight of private-sector retirement plans does not extend to public-sector pensions. Some are concerned that state and local retirement systems may not be able to continue to provide the benefits that participants and beneficiaries deserve. This white paper surveys state and local pension programs across the country, highlighting key issues, divergent approaches between states, and ideas for fundamental reforms.

I hope this report contributes to the ongoing conversation about preserving the retirement security of our nation's state and local public employees.

Sincerely,

Jonathan A. Wolfson

Deputy Assistant Secretary for Policy

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Introduction

> *"How did you go bankrupt?" Bill asked.*
> *"Two ways," Mike said. "Gradually and then suddenly."*
>
> *- Ernest Hemingway, The Sun Also Rises*

The snippet of dialogue above captures some important truths: risky financial practices often do not have immediate consequences, but as the risky conduct continues, the likelihood of bad outcomes grows and compounds. In matters involving debt, compounding is not simply a figure of speech: the consequences of a series of bad choices involving debt don't just add up, they multiply. As debt continues to accumulate, the debtor can approach a tipping point at which the risk of financial catastrophe accelerates.

Those who create risks for themselves behave badly; those who create risks for others behave worse. For decades, many of the choices made by state and local government retirement systems have created a systemic risk of bad outcomes. A collection of bad decisions made by state and local governments has increased the likelihood of a pension crisis — a situation in which their retirement systems cannot pay out the payments they owe to the retirees who depend on them.

Many state and local government pension systems are underfunded today. As instances of underfunding become more pervasive and commonplace, this should be understood as something like a series of illuminated warning lights on a car's dashboard. These warning lights do not simply signify that the car is running out of fuel. Rather, they can suggest systemic problems with the vehicle which, if not addressed promptly, only increase the possibility of a catastrophic outcome.

People may disagree about what has caused the underfunding of any particular pension plan, but widespread state and local pension underfunding is an unambiguous fact. Underfunding means risk: the risk that, at some point, a pension's available assets may be insufficient to cover how much it must pay out. Underfunding is not merely an issue of accounting; it is fundamentally incompatible with good governance.

As public pension underfunding becomes larger, fiscal pressures on state and local governments grow larger and pension defaults become more likely. Pension underfunding was an important cause of many of the previous decade's municipal bankruptcies, stretching from Stockton, California to Detroit, Michigan to Central Falls, Rhode Island. As one congressional study of this issue noted: "Unfunded obligations are implicit government debt, although not as transparent as explicit debt such as municipal bonds."[1] More bond defaults are a rising possibility unless state and local governments take corrective action. If pension defaults become widespread, we will approach a pension crisis — a crisis that can force tax increases, public spending cuts, and widespread defaults and inflict all manner of public and private miseries. Notably, every state has the power to increase its own tax rates — and the exercise of that power can be used to fulfill pension promises and accomplish other spending priorities — but such power has limits.[2] Inaction in the face of this looming problem may postpone the day it must be addressed — but on that day of reckoning, we will discover that inaction has exacerbated this problem's impact.

This Report has several goals. It summarizes the finances and operations of the nation's state and local pension plans today and the challenges they face. It describes the pressures, the regulatory frameworks, and the choices which have produced these current burdens and challenges. It draws some lessons from the varied institutional structures and economic outcomes of public-sector pensions and private-sector retirement programs. Finally, it suggests some routes to reform in order to promote sound pension administration and enhanced retirement security. This Report's central aim is to illuminate the pension problems faced by state and local governments, policymakers, and taxpayers — and to encourage states and localities to address these problems.

America's looming pension crisis can be resolved. Mike Campbell's laconic explanation in *The Sun Also Rises* of how his bankruptcy happened — "gradually and then suddenly" — has broader applications. Although many of America's pension systems are underfunded, so far things have become worse only gradually, and not yet suddenly. There is still time to reform our state and local pension systems and avoid the fiscal chasms that current trends portend.

Executive Summary

This Report addresses the widespread underfunding of the retirement systems in the nation's state and local governments. It begins by summarizing some past, current, and probable future trends of unfunded pension liability at the state and local levels. It describes the scope of unfunded pension debt in various state and local jurisdictions and calculates both their aggregate debt and per capita debt, based on states' self-assessments; it then incorporates a variety of other measurements of unfunded liability. Results from many of those other measures suggest that the magnitude of unfunded pension liability may be considerably larger than previously indicated.

This Report then describes and analyzes the inherent dynamics of government retirement systems that have produced this underfunding, finding that there are a variety of pressures and processes within these retirement systems that can operate to the disadvantage of employees, beneficiaries, and the public generally. It then summarizes attempts to reform pension systems in several states. Some of those states now have relatively sound retirement systems; others less so. It then contrasts the requirements that govern most private-sector pensions to the relatively relaxed regulatory regimes of state and local government pensions, concluding that adoption of rules similar to those governing private-sector requirements would likely have positive consequences if implemented for state and local government pension plans and their beneficiaries.

The nation's experience with unfunded pension liability at the state and local government levels may provide some lessons for policymakers; this Report concludes with several recommendations in this area.

This Report focuses primarily on state and local government retirement systems, not those of the private sector or of the federal government. However, its first appendix contains a brief history of several measures to promote cost savings and employee choice in federal retirement systems. A second appendix provides an extensive dataset of state and local unfunded pension liabilities, measured in a variety of ways.

Chapter 1: The Nuts and Bolts of State and Local Pensions

The Operations of State and Local Pensions

> *"My other piece of advice, Copperfield," said Mr. Micawber, "you know. Annual income twenty pounds, annual expenditure nineteen nineteen and six, result happiness. Annual income twenty pounds, annual expenditure twenty pounds ought and six, result misery."*
>
> *- Charles Dickens, David Copperfield*

This Report describes a phenomenon that is often assigned the polite euphemism of "pension underfunding." The reality behind this euphemism is that America's state and local government employees rely on retirement systems that, in most instances, owe more than they can pay: more precisely, these retirement systems cannot keep the promises of future retirement benefits that have been made based on current contribution levels and plausible predictions of financial returns. (An even more precise description of this problem: the present value of promised benefits is larger than the present value of the assets that have been dedicated to make good on those promises.) Twenty years ago, even as retirement benefits had become significantly more generous, state and local pension systems appeared, for the most part, to be fully funded. But in the last two decades, many of these pension funds have become insufficiently funded, resulting in negative effects on public workforce compensation and compounded increases in unfunded pension liabilities. These liabilities are immediately borne by the budgets that fund the public-sector workforce of state and local governments; ultimately, however, many jurisdictions will either see a greater share of state or local spending used to pay these obligations or state taxpayers are likely to see their rates rise as new revenue will be sought to shoulder a significant portion of unfunded state and local pension liabilities.

In order to understand the problems with state and local pension systems today, a brief discussion of their dynamics may be useful. These public employee retirement systems are

typically funded with several revenue streams. Public employees pay into these pensions by means of a fixed percentage of money withheld from their paychecks; their employers (ultimately public treasuries) also pay into these pensions to cover the remainder of what each pension must ultimately pay out to support its beneficiaries. These revenue streams are supposed to fund what is often called the "normal cost" of a pension: namely, the net cost of a year's payouts to pension beneficiaries as well as the related administrative costs. When these revenue streams are or will be insufficient to cover obligations, this creates debt: by and large, this Report calls this debt "unfunded pension liabilities." This system of multiple revenue streams is also common in the funding of pensions in the private sector; the combination of employee contributions and employer contributions funds the normal cost there as well. (In the public sector, because the government is also the employer, government funds cover the remainder of the cost of pension funding that is unpaid by employees.) State and local government employees participating in public pension plans are generally promised payments that commence at retirement for as long as they live, based on factors such as years of service and salary — if their government service is sufficiently long to vest in the plan. Some plans have features that make the plans more costly, such as early retirement benefits and cost of living adjustments.

Just as state and local governments pay salaries in the year earned, sound financial practice requires pension plans to collect contributions to support benefit promises as benefits are earned, rather than paying pensions out of general revenues when those payments become due. Calculating the value of pension liabilities can be a complex enterprise. Actuaries make a variety of assumptions about future occurrences, such as life expectancy and expected future service, to calculate the stream of future pension payments accrued by participants. The total value of the plan's pension liability is the sum of each future year's expected pension payments discounted to their present value. Each year, contributions to the plan will ideally be equal to the sum of the present value of the benefits employees are projected to earn that year and the plan's administrative expenses. If the plan is underfunded, the contributions should also be enough both to cover the resulting interest on the underfunding and to amortize (that is, to pay down) a portion of the underfunding over a

period of years. If the contributions are not sufficient to cover these obligations, the plan has negative amortization — that is, the plan is digging itself into a deeper hole.

This Report also uses a catch-all term for the set of government employees and consultants who make pension decisions based on their professional responsibilities and fiduciary duties: "pension administrators." Pension administrators attempt to balance the pension's books by estimating the value of present and future assets in pension accounts as well as the value of the liabilities that those assets must cover over time. Pension administrators must determine, typically on an annual basis, how much a pension system will have to collect in normal cost. To calculate normal cost, pension administrators must estimate (for instance) future returns on pension assets and lifespans of the system's beneficiaries. Those estimates drive the calculation of both the normal cost that is required to support pension beneficiaries and the rate of growth of pension investment assets that is required to support beneficiaries in the future.

If pension administrators underestimate normal cost, a pension fund will necessarily take on debt; similarly, a pension fund will take on debt if the government body that is supposed to fund a pension chooses to underpay its normal cost obligations. These are the unfunded pension liabilities referred to above; they are typically measured by calculating the ratio of a pension's assets to its promised benefits.

Pension actuaries project these additional obligations out over a period of years to calculate how much a pension fund's investments must return to cover its unfunded liabilities. (For state and local pensions, that time period is typically 15-30 years; federal law requires most private pension plans to use a far shorter — more conservative — period, as discussed below, to ensure that pension promises cannot remain unfunded for too long.) A portion of debt is then paid down over time; payments are generally made once a year. Payments on this amortized debt are, in some respects, similar to the monthly amortized payments that homeowners make to satisfy a mortgage debt or that automobile owners make to pay off an auto loan.

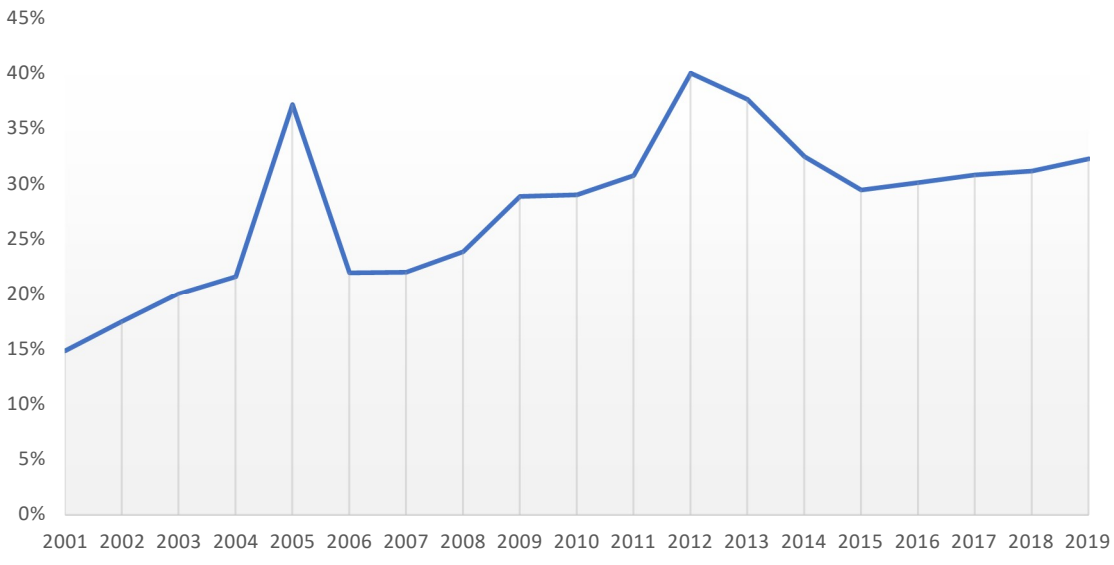
Recent Trends

> *For years, self-interested parties, overly generous promises whose true costs were often shrouded by flawed actuarial analyses, and failures of public leadership had caused unsustainable public pension liabilities.*[3]
>
> *Jerry Brown, governor of California, 12/28/17*

A comprehensive history of state and local pension funds is beyond the scope of this Report, but the following data points should be helpful: the reader who wants to understand the nature of these pensions in the modern era should keep some basic pension dynamics in mind.

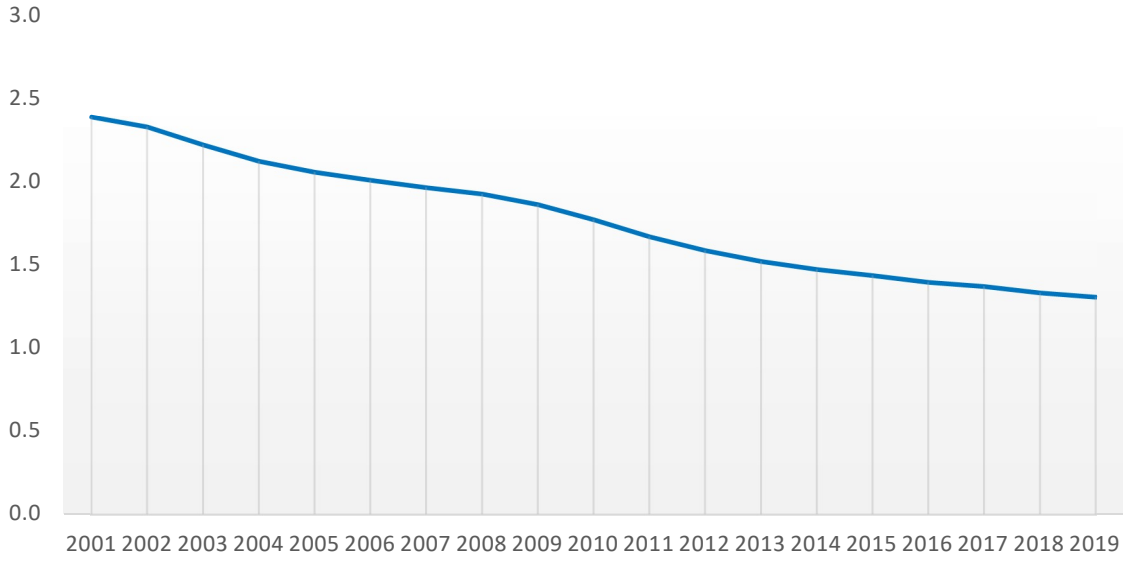
- There are over 5,500 state and local pension plans in the United States; they serve roughly 21 million participants.[4] State and local pension plans have vastly expanded since 1857, the year when New York City created the first one in the nation — a plan that provided its police officers with a lump-sum compensation payment if they were injured in the line of duty.[5]

Figure 1: Average Actuarially Required Contribution Rate to State and Local Pension Plans (As a Percentage of Payroll)



- As shown in Figure 1, government and employee payments into state and local pensions have increased significantly in the last two decades.[6] Figure 1 depicts the portion of the income streams that state and local pensions have called on public treasuries and public employees to pay in over the past two decades as a percentage of payroll; these costs have more than doubled over this 20-year period, even though employee numbers and government budgets have not seen corresponding growth. (Notably, these are costs that must be paid in order to meet actuarial targets; they are not a measure of the actual payments that are ultimately made.)

Figure 2: Ratio of Plan Active Members to Beneficiaries

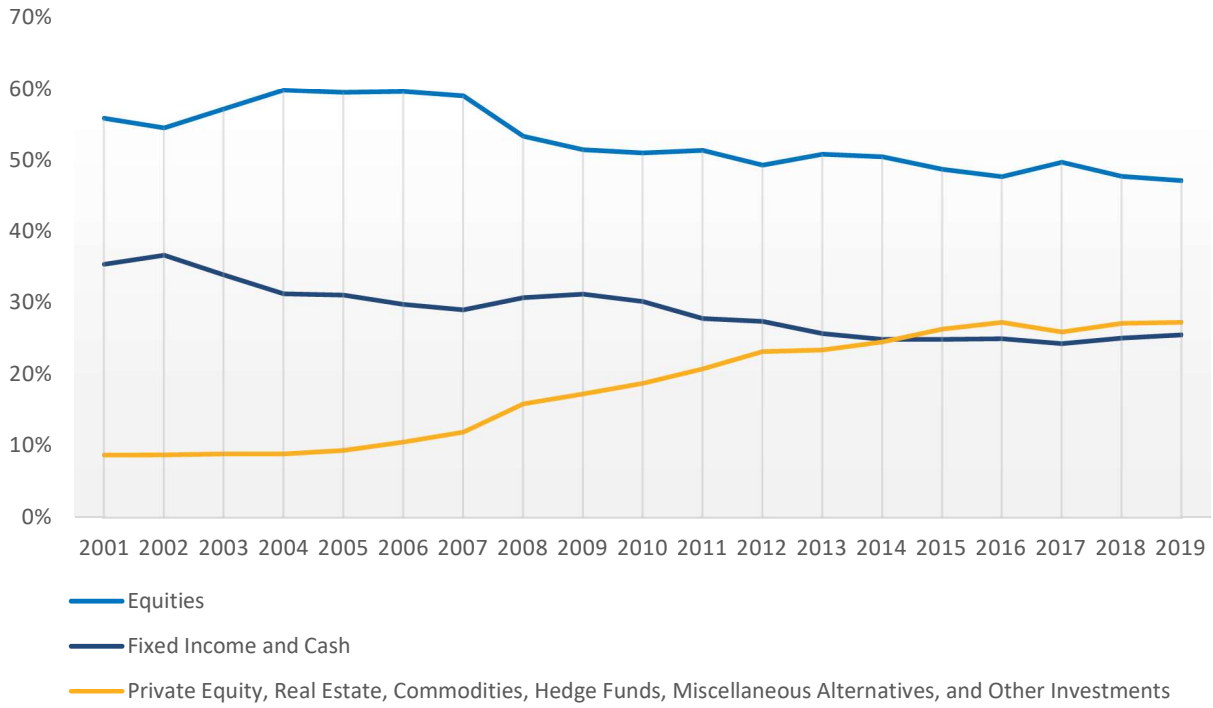


- As shown in Figure 2, the ratio of active plan participants to retirees has continued to shrink.[7] Figure 2 shows that the composition of government pension participants has changed over time as more and more employees reached retirement age and qualified for pension benefits; correlatively, over time, fewer and fewer active workers pay into the system for every retiree who has earned pension benefits. Between 1960 and 2017, the number of total pension beneficiaries in this sector quadrupled; the ratio of active workers to current pensioners shrank by roughly 80 percent. At the end of the Eisenhower presidency, the ratio of workers to retirees in

state and local government was just under 7; at the beginning of the Trump presidency, that ratio was roughly 1.4.

- Notably, the ratio of active employees to retirees has decreased because state and local government workforces are growing. The number of employees on state and local payrolls increased significantly during that 1960-2017 period: while the U.S. population grew by 80 percent, state and local employees grew by 186 percent.[8]
- From both a relative and absolute perspective, benefits in the public sector have skyrocketed in recent years. From 1998-2017, state and local government employees saw a 90 percent increase in benefits as measured in real dollars; for workers in public education, the corresponding figure is 84 percent. In contrast, private-sector workers saw gains in benefits of 39 percent over this time.[9] The universe of public-sector compensation comprises less salary and more benefits.

Figure 3: Pension Investment Asset Allocation Since 2001



- When viewed as a whole, asset allocations of state and local government pensions have shifted dramatically during the 21st century. The average plan's stock holdings and fixed-income holdings shrank by 16 percent and 28 percent respectively;

meanwhile, the alternative asset holdings of the average pension tripled.[10] Alternative asset holdings, as measured by Figure 3,[11] include less traditional pension investment assets such as commodities, real estate, private equity, and hedge funds. Pension administrators may be investing more in alternative asset holdings in an attempt to capture higher returns over the long run. As discussed further below, these more aggressive investment strategies may be motivated by a variety of purposes. Pension administrators may be attempting to achieve higher returns to address underfunding while minimizing contribution increases; they may also be attempting to justify high rates so as to discount plan liabilities.

It is not unusual for state and local pension plans to be required to amortize unfunded liabilities (or any surplus) over periods of two or three decades. There is a great deal of variance among jurisdictions as to whether they regularly make their actuarially required contributions and to what extent these contributions can be adjusted. Some public pension plans use backloaded amortization schedules, under which the required payments towards the end of the amortization period are far higher than those required in the beginning. Plans that satisfy their actuarially required contribution requirement may nonetheless, under backloading, create negative amortization for themselves. This is in contrast to the federal requirement for private-sector, single-employer plans, which must amortize unfunded liabilities over seven years in equal installments.

Future Headwinds

> *If you're counting on the stock market bailing you out of this, it ain't gonna happen.*[12]
>
> *- Steven Rodeman, executive director of Oregon's Public Employee Retirement System, commenting on rising pension contribution rates, 9/22/16*

When administering defined-benefit pension plans, pension administrators may be assuming that the future will be like the past and that equity prices and other investments will rise over the long term at the same rate as in the past. Such assumptions are understandable, but the prevalence of inherently unpredictable events needs to be taken

into account: their consequences may have impacts on equity markets that stunt investment portfolios' growth. The COVID-19 pandemic is a possible example (of course, it is impossible to say what equity markets would look like in a coronavirus-free universe). As discussed below, public plans typically use liability discount rates based on expected rates of return on assets. As the expected return on fixed income investments drops, trustees feel pressured to shift into more aggressive investment portfolios in order to justify the continued use of high discount rates. Lowering the discount rate would increase the present value of the pension liabilities, leading to higher required contributions that trustees are under pressure to avoid.

Most state and local pension plans assume a rate of return on investments of over 7 percent; however, as discussed in greater detail in Chapter 3 below, it is reasonable to expect fixed income portfolios to earn significantly less than this figure in the next few years. In the early 1980s, the federal funds rate was over 15 percent; over the last 100 years, the federal funds rate has often been above 5 percent. In contrast, the federal funds rate stands at 0.25 percent as of this writing; it has not been above 2.5 percent in over ten years. This may be good news for home and business borrowers, because the costs of borrowing are at historic lows, but it necessitates an adjustment in the financial planning of public-sector pension plans.

In their pursuit of higher returns, some pension administrators have been shifting their fixed-income investments into equities and alternative investments; pensions are betting that these riskier assets will perform better. There is some question as to whether this strategy will be successful: William Dudley, past President of the Federal Reserve Bank of New York, believes equity returns over the next decade will likely be "no greater than 5% or 6%."[13] Pension administrators — whose central responsibility is to produce an asset mix that can keep up with their target rate of return — may find meeting that charge difficult. A failure to keep up with rate-of-return assumptions would increase state and local unfunded liabilities; it might require state or local governments to pour more cash into actuarially troubled pension systems, or even in extreme cases force pension defaults. Either scenario would leave public-sector retirees and state and local taxpayers in a precarious fiscal position.

How Big Is the Problem?

> *Politicians in our Legislature, as well as in many others, were loath to raise taxes or cut other spending to fund fully the future obligations for pension systems. So they avoided the political trouble, and made decisions on the basis of short-term thinking. Over time, Louisiana has made a wiser choice to pay these down with big annual contributions from the state budget. Those payments will squeeze the budget for decades to come...*[14]
>
> *- Daryl Purpera, Louisiana legislative auditor, 5/20/19*

Some commentators argue that the size of the unfunded liabilities borne by state and local pensions is so large that we are at the doorstep of a pension crisis.[15] To appreciate the scope of these liabilities, it is important to understand the disagreement over how best to measure them.

As explained in more detail in subsequent chapters, most single-owner private-sector pension plans are relatively well-funded today; federal law makes significant underfunding of these private-sector pensions less likely by mandating relatively strict amortization and measurement methods and contribution schedules. The funding of state and local government pensions, however, is for the most part governed by state law, not federal law; the political dynamics surrounding state and local pensions often result in inadequate funding. Notably, even though both of these two classes of pensions are typically structured so as to have the same kind of *inflow* of funds (as discussed above, they are funded by employer and employee contributions with amounts that are determined by a fixed percentage of employee payrolls), their *outflow* of funds — that is, the set of long-term liabilities for these two classes of pensions — rests on two quite different patterns.

Most private-sector pension plans today are defined-contribution systems. Speaking generally, a participant's benefits in a defined contribution plan can be summarized by the participant's retirement account balance, which depends on factors such as employer and employee contributions and investment returns. Ensuring that pension payments are predictable and secure in a defined-contribution system is a relatively simple process,

because the system's long-term obligations are relatively easy to monitor and calculate. Employees make their own decisions about contributions and investments for their own individual retirement account; they bear the upside and downside risks of those decisions. However, state and local pension plans are predominantly defined-benefit plans, which create categorically distinct administrative complexities and financial obligations. A defined-benefit plan requires pension managers to make complex and technical decisions about matters like investment strategy, cash flow, and asset valuation in order to ensure that the pension's assets will be sufficient to pay all of its obligations. Those obligations are repeated and relentless; they come year after year; they force difficult predictions; and inaccurate predictions can themselves be the source of increased pension liabilities. Notably, some federal pension systems have partially transitioned from defined-benefit plans to defined-contribution plans in recent decades: Appendix A provides a brief account of some of the implications of this transition.

Pension policies are determined by a variety of different actors, and it is fair to say that those actors will respond in a variety of ways to the incentives that are created by the rules of pension governance. State and local government employees and the unions that represent them can be expected to lobby policymakers to increase their compensation, just as other interest groups can be expected to lobby policymakers to increase spending in other areas. Historically, some policymakers have responded to these pressures by agreeing to provide increased future compensation in the form of pension benefits that are not payable for many years rather than increased salaries that must be currently paid to employees (which would require immediate spending cuts in other areas or tax increases). In addition, policymakers have deferred required contribution to pension plans, even under their own pension rules; this has the effect of forcing future policymakers to deal with larger, compounded unfunded pension liabilities at a later date. Different policymakers have different time horizons, and some actors may have time horizons that take little or no account of pension liabilities that come due decades in the future. The bottom line is that the incentive structure that results from combining defined-benefit plans with public administration can create problematic pressures. Those may include pressure to increase pension benefits in such a manner that their costs are not fully borne

immediately, pressure to use pension accounting mechanisms that understate or de-emphasize long-term pension liabilities, and pressure to address pension obligations by shifting cost obligations from the present to the future.

A Roadmap For This Report

Given the methodological disputes over measurement described above, any serious discussion of the nature of the nation's state and local pension liabilities requires some exploration of the implications and results of these different methods and measurements. Varying methodologies show drastically different outlooks for pension systems, and plan administrators have incentives to choose methodologies that accentuate the positive when (for instance) decisions must be made about pension contributions in a given year.

This Report therefore describes and compares the results of several different methods of measurement of pension liability. Chapter 2 describes the methods and results of calculating assets and unfunded liabilities that are typically used by public pension plans to report their finances and determine their required contributions. Chapter 3 compares these findings with other measurements of unfunded pension liabilities, incorporating metrics from external sources.

Generally, pension plans provide more positive estimates of their financial positions than external observers do. This is typically because plans will use their expected investment returns to discount their liabilities, while economists use the market value of the liabilities — a factor that is completely unrelated to expected investment returns and that requires relatively low discount rates due to the high level of protection afforded to pension payments promised by these plans under state law. Disputes about which methods of measurement are most appropriate are sometimes difficult to resolve, but those disputes can reveal a broader picture of the nature of unfunded state and local pension liabilities. This Report, therefore, provides a variety of methods that can be used to estimate the liabilities of state and local pension systems; it also provides state-by-state liability figures for each of these methods.

This Report then finds in Chapter 4 that state and local pension administrators face unique pressures that are typically not shouldered by their private-sector counterparts. The Report discusses the impacts of what it calls temporal pressures, representational pressures, ideological pressures, and political pressures, finding that the results of these pressures can be counterproductive to sound pension administration.

In Chapter 5, this Report provides brief accounts of real-world pension problems in four states. In Chapter 6, this Report compares the rules for public pension plans to the federal statutory requirements for single-employer and multiemployer pension plans. The Report's final chapter consists of a set of general pension-reform principles for policymakers to consider.

Chapter 2: Unfunded Pension Liabilities As Measured by State and Local Governments

A Landscape of Underfunded Pensions

> *Plenty of folks bear the responsibility for this gloomy state of affairs. For years, particularly in municipal and state plans, employers and employees paid too little in contributions to meet accrued benefits. Accounting and actuarial rules allowed both public and private pensions to avoid reporting their actual state of poor health.*[16]
>
> *- Olivia Mitchell, Executive Director, Pension Research Council, the Wharton School of the University of Pennsylvania, 11/5/18*

This chapter describes the consequences of a particular kind of measurement of the unfunded liabilities of state and local pensions systems — namely, measurements that are produced by those government bodies themselves — as reported in their Comprehensive Annual Financial Reports (CAFRs). Using these internal assessments or self-assessments, administrators of pension plans calculate and promulgate pension-specific data such as assets, liabilities, and assumed or predicted rate of investment returns. These assessments demonstrate that state and local pensions are significantly underfunded.

The most consequential assumption made by plans is the rate used to determine the present value of pension liabilities. Other important assumptions include mortality,[17] length of service, and the extent, if any, to which the value of assets can be reported as differing from the fair market value of those assets ("asset smoothing").

These CAFRs typically incorporate assumptions by state-contracted actuaries. Although the actuaries are supposed to be independent and use their professional judgment, they are well aware that plans are generally seeking to minimize contributions and are therefore under pressure to use assumptions that will accomplish that end.[18] All 50 states also report public pension assets and liabilities under the Government Accounting Standards Board's (GASB) Form 67 standards, but generally do not use these measurements for official purposes, such as determining the actuarially required contribution.

(This Report discusses measurements based on GASB standards — and several other methods of measurement — in Chapter 3.)

Figure 4: Pension Funding Ratio by State
(Plan Year 2019)

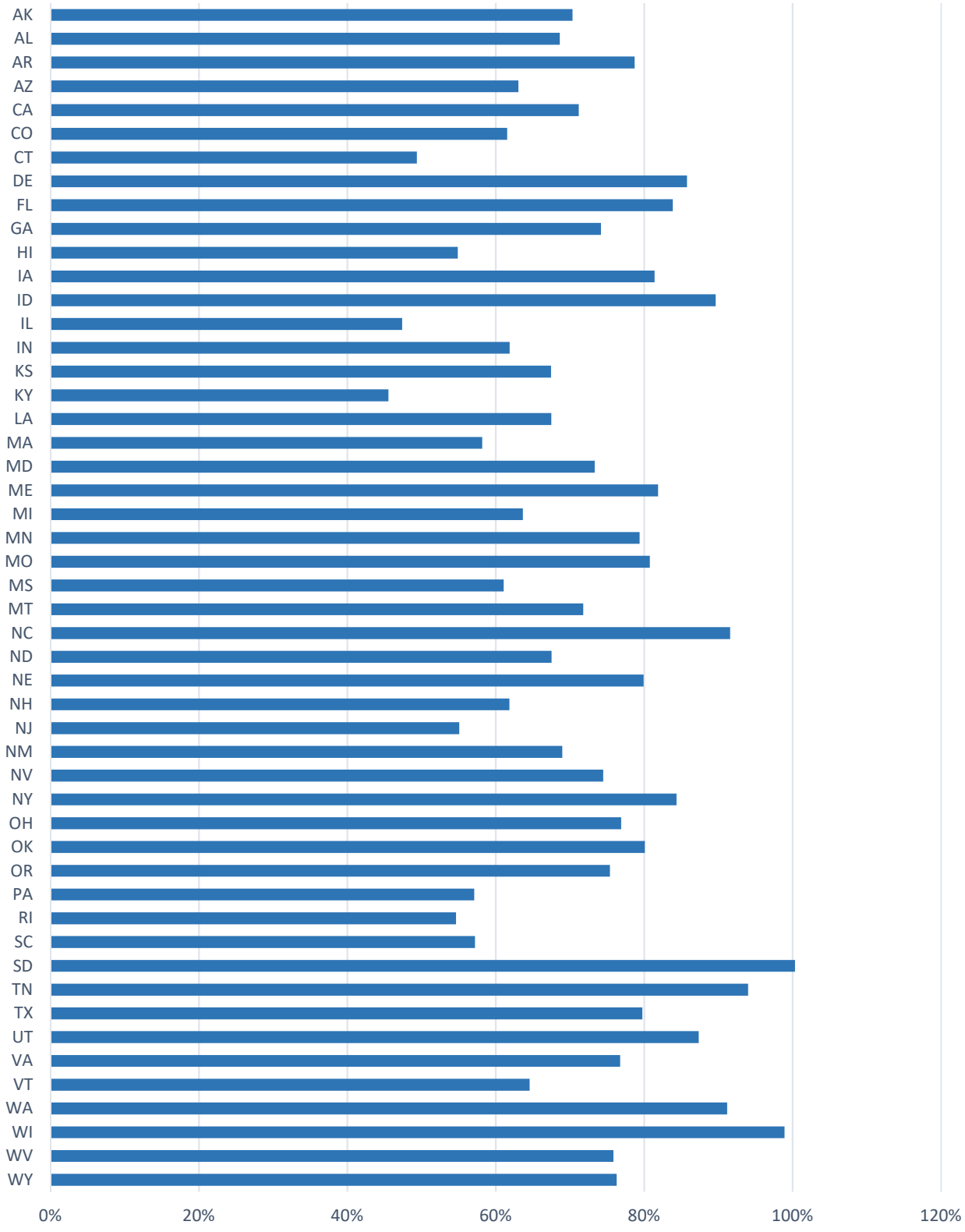


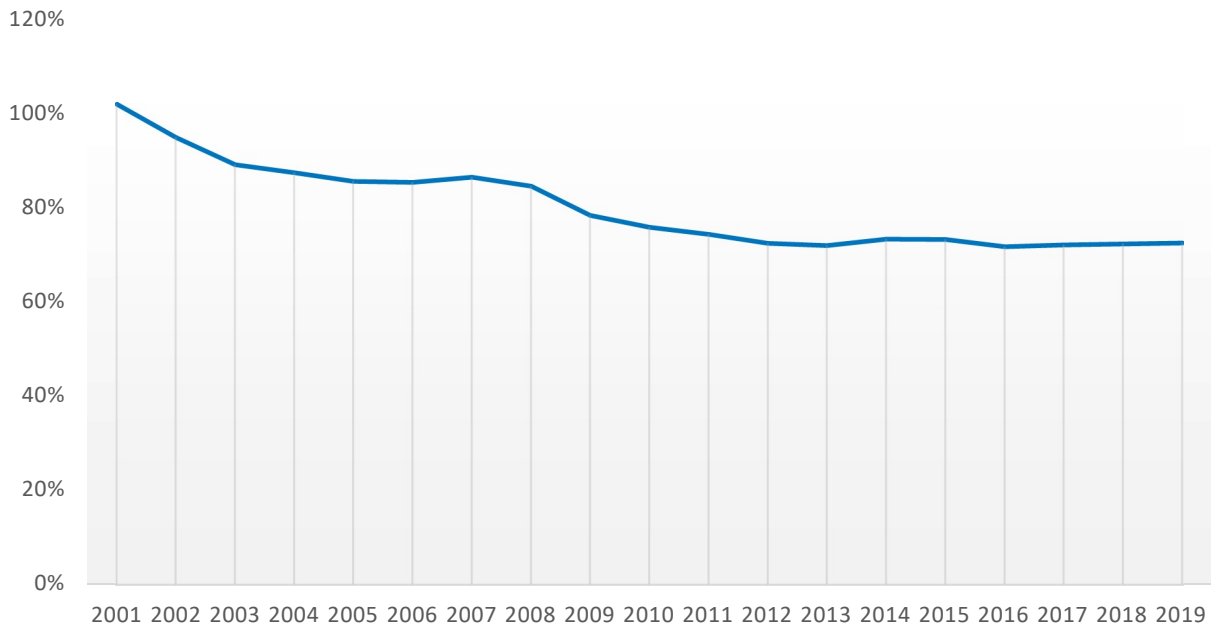
Figure 4 is a snapshot of the funding ratio for 2019 of each state's pension assets to the state's pension liabilities.[19] That funding ratio can be viewed as a measure of unfunded pension liability: the lower the ratio, the larger the liability. (This state-by-state survey does not include the pension liabilities of the District of Columbia; for a variety of reasons, its circumstances are not really comparable to those of states.[20] However, this report's *aggregate* calculations of public pension assets and liabilities include those of the District of Columbia.) In a nutshell, Figure 4 shows that the pension plans in most states and localities are significantly underfunded, even by the plans' own assumptions. This chart represents multiple pension systems in states: most states have separate pension systems for teachers, police officers, state employees, and so forth. This Report combines the assets and liabilities of each state's pension plans in order to calculate each state's pension funding ratio. Furthermore, many of the state percentages also include a representative selection of local pension plans within that state.

Each of the 50 percentages in Figure 4 therefore represents a composite of a state's pension systems. The data this Report relies on comprises roughly 95 percent of all pensions in the United States (as discussed below) and provides a representative sample of all pensions in the nation. It comprises 199 pension plans; of these, 42 are for teachers, 35 for police, fire, and/or safety workers, and 122 for all other workers. Of these 199 pension plans, 85 are creations of cities, counties, or some other local government unit (that is, rather than of states); nonetheless, many states oversee such plans to varying extents, even if they are organized at the city or county levels. The Illinois figure, for instance, comprises eight pension systems: three state employee pension systems, three Chicago pension systems, a Cook County pension system, and a university pension system.

When weighted averages are used, the data from these 199 pension plans is a fair representation of the status of state and local pension plans across the country. This Report's baseline pension assessments rely on datasets from the Public Plans Database of Boston College's Center for Retirement Research; this data spans fiscal years 2001 to 2019 and accounts for roughly 95 percent of assets (and participants) of state and local pensions in the United States. However, these datasets do not take into account roughly 5 percent of

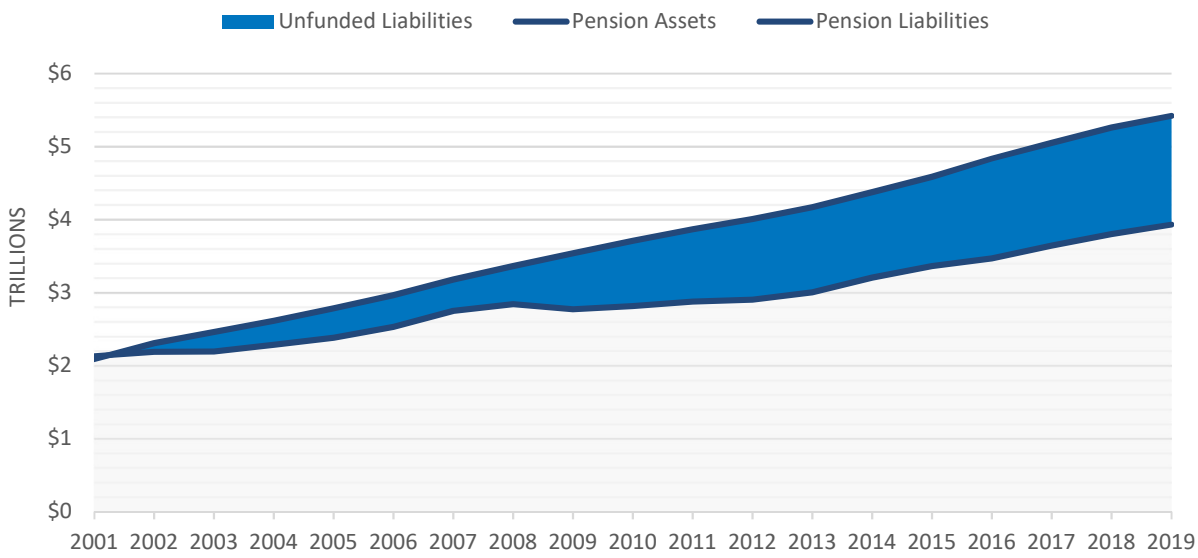
state and local pension assets; these are holdings in thousands of other pension treasuries, each of which is comparatively minute.

Figure 5: Public Pension Funding Ratio (2001-2019)



The country-wide composite of pension funding ratios shown in Figure 5 reveals significant decreases in average funding ratios over time.[21] Figure 5 shows that the magnitude of the underfunding problem grew significantly in the first decade of the 21st century, especially around the "Great Recession" of 2007-2009. Pension managers subsequently made changes in an attempt to correct course and reduce unfunded liabilities; the aggregate results of the most recent decade suggest that, as a class, pension administrators failed at this goal. Despite historic growth in equity markets over the last decade, state and local pension funds failed to rebound to the comparatively sound levels seen at the turn of the 21st century, in which a relatively small portion of unfunded liabilities was the norm.

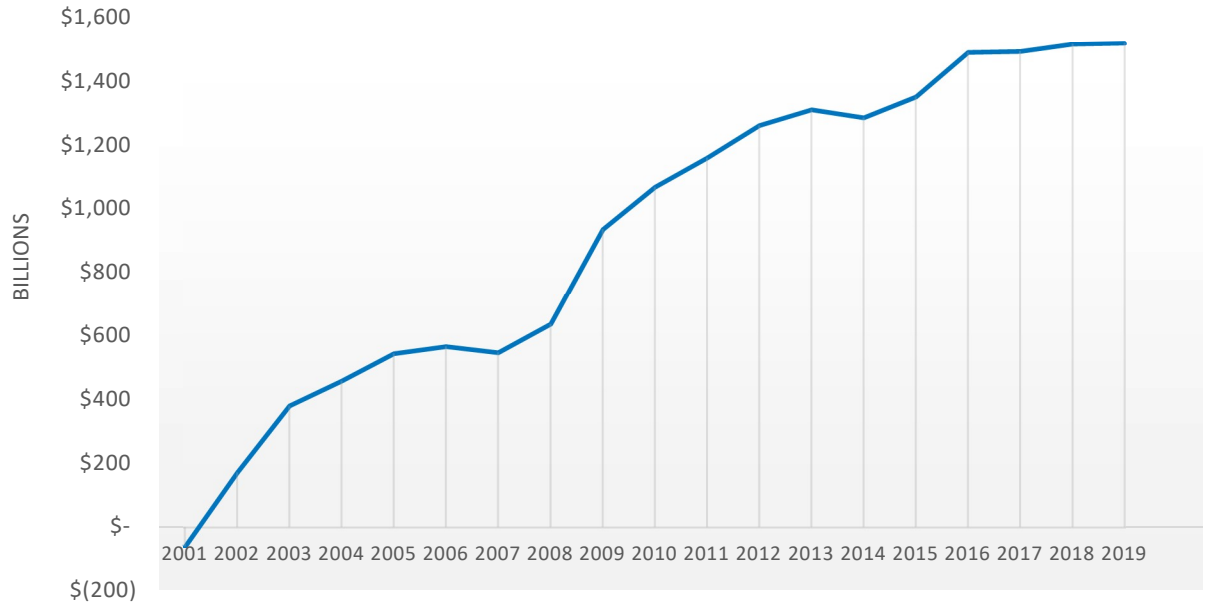
Figure 6: U.S. Public Pension Assets and Liabilities (2001-2019)



When we compare changes in pension assets and pension liabilities over time and calculate each year's differences (see Figure 6), the figures tell more or less the same story.[22] Figure 6 shows that, over the course of the first two decades of the 21st century, the rate of growth of aggregate state pension liabilities swamped the rate of growth of aggregate pension assets. The shaded field in Figure 6 does not simply depict the magnitude of aggregate state and local pension liabilities; comparing the two rates of growth suggests that, over time, liabilities are leaving assets in the dust.

A series of yearly pension deficits will, by definition, create greater aggregate pension debt. Figure 7 shows that, in the aggregate, state and local pension unfunded pension liabilities (when measured in constant dollars) has tripled since the outset of the Great Recession — despite extremely high stock market returns since that time. A longer look back reveals that state and local pension unfunded liabilities have multiplied from about $100 billion near the beginning of the 21st century to about $1.5 trillion in 2019.[23]

Figure 7: Total Pension Unfunded Liabilities by Year
(Adjusted for Inflation to 2020 Dollars)



Pension deficits have many causes, and it would be challenging to assign appropriate weight to any particular cause for any particular pension shortfall. Nonetheless, it is fair to generalize by saying that the underfunding of a state or local pension is often driven by one or more of the following three institutional factors:

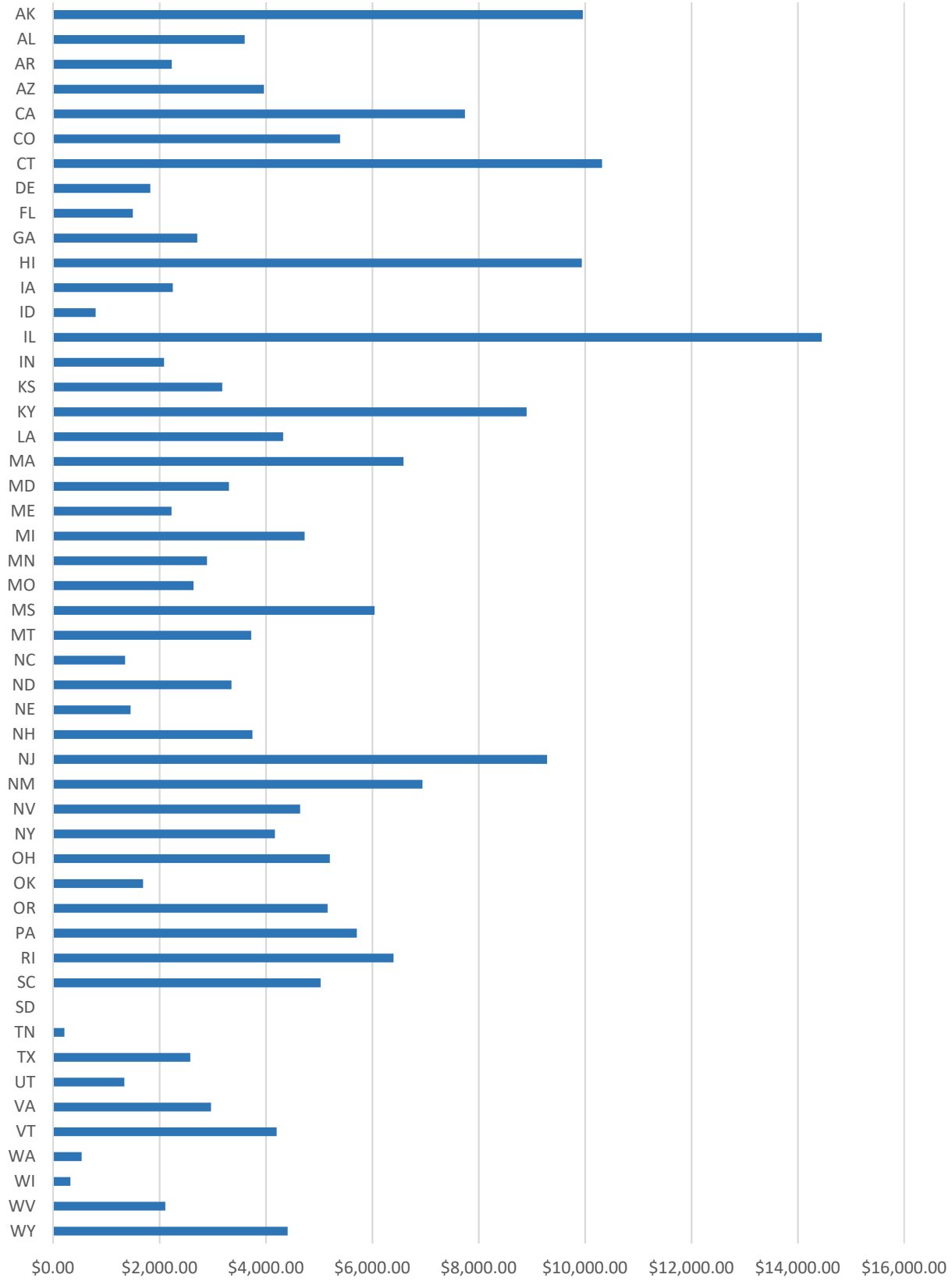
- Policymakers providing large and unsustainable promises and payouts to retirees;
- Budget decisionmakers failing to provide sufficient funds to pension systems to cover the employer's share, so that the funds in retirement accounts are insufficient to pay obligations; and
- Pension administrators making unreasonably optimistic predictions about such matters as the rate of return on various pension fund investments, resulting in unrealistic and failed predictions about future pension assets.

A Comparison of Unfunded Pension Liabilities By State

> *The threat of having to take funds from other vital government services — government services that our state cannot operate without — is real. Pennsylvania isn't like the federal government. We can't just print money. We need a new status quo in pension liability that prioritizes working together to find solutions that meet the needs of citizens and, hopefully, sets a bar the other states will be driven to match.*[24]
>
> *- Keith Greiner and Seth Grove, Pennsylvania state representatives, 12/25/19*

All pension systems are not alike; the average and aggregate figures above cannot depict the differences between states — some of which have significantly larger unfunded pension liabilities than others.[25] The vast majority of states have unfunded pension liabilities under $50 billion. Only seven states have unfunded pension liabilities greater than $50 billion; five of those states (New Jersey, New York, Ohio, Pennsylvania, and Texas) have unfunded pension liabilities between $50 billion and $100 billion. Illinois and California carry the heaviest burden of unfunded pension liabilities: Illinois's unfunded pension liabilities are over $180 billion, while California's unfunded pension liabilities are over $300 billion. The reader will find a state-by-state breakdown of unfunded pension liabilities in Appendix B.

Figure 8: Pension Funding Ratio by State
(Plan Year 2019)

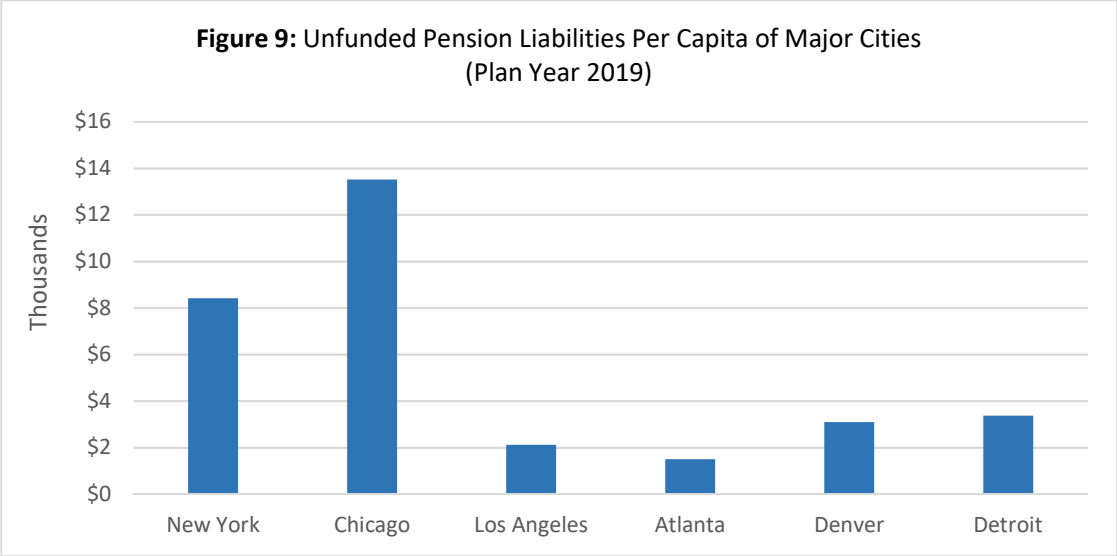


However, for purposes of interstate comparison, calculating each state's unfunded pension liabilities per person (that is, per state resident) is arguably a more relevant measure. Figure 8 shows that per-person unfunded pension liabilities are more evenly distributed among states than aggregate unfunded pension liabilities, but that there are still extremely significant differences.[26] (It is worth reiterating here that these dollar figures for states also include the unfunded liabilities of major local pension systems within states.) Eleven states' pension debt imply a per-person debt of less than $2,000; twenty-eight states' pension debt imply a per-person debt between $2,000 and $6,000; and another six states' pension debt (California, Kentucky, Massachusetts, Mississippi, New Mexico, and Rhode Island) imply a per-person debt between $6,000 and $9,000. Finally, at the end of the per-person debt tail, the five most indebted states are New Jersey ($9,286), Hawaii ($9,940), Alaska ($9,961), Connecticut ($10,322), and Illinois ($14,450). It may be useful to think of the debt-per-person figure as revealing an implicit tax burden borne by each state's population, since if states and localities cannot correct chronic underfunding by other means, they are likely to look to taxpayers to make up the difference.

Some Snapshots of Underfunded Local Pensions

> *It's not sustainable. These costs are going to make things incredibly challenging.*[27]
>
> *- Leyne Milstein, City of Sacramento, CA finance director, on a projected doubling of Sacramento's pension contributions over the next seven years, 10/13/17*

To reiterate, some of the pension data attributed to particular states in Figures 4 and 8 above actually reflect pensions that have been created or that are managed by political subdivisions within those states, such as cities or counties. And as noted, these figures are averages: any particular state-summary figure may obscure the possibility of (for instance) a well-managed system at the state level combined with a poorly-managed system at the local level. A comprehensive account of the unfunded pension liabilities of every local government in the United States is beyond the scope of this Report, but the reader may find a brief account of selected local governments' unfunded pension liabilities to be of interest.



Many localities have significant unfunded pension liabilities, as shown in Figure 9: Los Angeles's unfunded pension liabilities are approaching $9 billion, Chicago's unfunded pension liabilities have topped $35 billion, and New York City's unfunded pension liabilities are just over $70 billion.[28] Denver and Detroit's unfunded pension liabilities are between $2 and $3 billion, while Atlanta's is less than $1 billion. To express these pension liabilities in per capita (that is, per city resident) terms: The per-person pension debt for Atlanta is under $2,000, Los Angeles's per-person pension debt is just over $2,000, and that of Denver and Detroit is between $3,000 and $4,000. New York City's pension debt is over $8,000 per person; at nearly $14,000 per person, however, Chicago's pension debt towers above these other municipalities.[29]

Chapter 3: State and Local Unfunded Pension Liabilities As Measured by External Sources

Expected Rate of Return and the Knowledge Problem

> *By choosing an unreasonably high assumed rate of return, trustees both reduce the set-aside and artificially suppress the reported size of pension promises, making the liabilities associated with the pension promises appear smaller than they really are. But eventually that choice cuts the other way. In fact, the more liabilities were artificially suppressed upfront, the greater the rebound effect in the future. That's in large part why pension costs keep galloping ahead even though the stock market has more than doubled since 2009.*[30]
>
> *- David Crane, Stanford University Lecturer, 11/23/15*

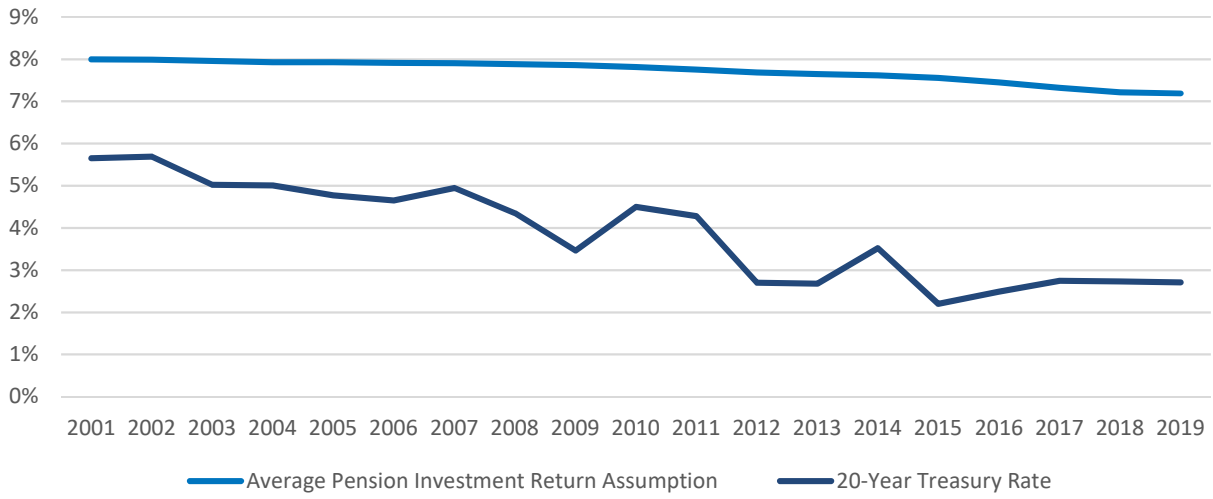
The calculations of unfunded pension liabilities of state and local governments that this Report summarizes rest on multiple assumptions. One of the more controversial assumptions concerns the assumed rate of return that pension administrators will be able to achieve over time. Pension administrators have very little discretion about certain aspects of their financial reporting; if a pension administrator misreported the size or nature of assets held in a pension fund, for example, that error would serve as a red flag that could signal fraud. However, state and local pension administrators have greater discretion when determining an assumed rate of return on pension investments; that is largely because the assumed rate of return for pension investments is not so much a question of fact as it is a question of judgment.

Many state and local governments have elected to use assumptions about pension rate of return that are likely over-optimistic; it follows that the magnitude of state and local pension liability described in the preceding chapter is likely to be significantly understated. It is certainly true that, as a class, public pension administrators have been overly optimistic about their rates of return in the first two decades of the 21st century; over the 2001-2019 period, state and local pension administrators on average assumed a 7.71 percent yearly investment return, but their actual historical record (again, as a class) was

6.59 percent — underperforming their assumptions on average by more than a percentage point every year.[31] A 1 percent yearly gap between expectation and reality, compounded over multiple years, will have sizable negative effects on funding levels.

At root, the incentives of pension administrators to make optimistic assumptions about their assumed rate of return are not so different from the incentives faced by someone who walks into a bank seeking a loan: in both cases, there are pressures to make representations about future income that are as positive as possible. Notably, a pension plan with a higher assumed rate of return implies (at least in the short term) a smaller and less burdensome regime of required payments to cover its liabilities; conversely, a lower assumed rate of return implies a larger and more burdensome set of debt payments.

Figure 10: State Plans' Average Return Assumption vs. 20-Year Treasury Rate



Over the last two decades, state and local pension administrators as a class have made mild reductions in their assumed rates of return on investment for the pensions they administer; on average, their assumed yearly rate of return has dropped from 8 percent to 7.19 percent, as can be seen at Figure 10.[32]

As shown in Figure 10, even though the 20-year Treasury rate has shrunk in half since 2001, the average return assumptions used by state and local pensions have barely moved. This suggests that state and local plans are deliberately increasing the riskiness of their

investment strategies. In an attempt to deal with underfunding, plans have reallocated money away from fixed-income investments towards equities and alternative investments and have made highly optimistic assumptions about their returns, as was shown in Figure 3. Despite that reallocation, pension administrators continue to see their actual returns lag behind their assumptions; their increased exposure to equities and alternative investments contributes to an increasing risk of more severe underfunding that could lead to pension default and inability of states and localities to meet their obligations.

To put this in perspective, one should understand what a 7.19 percent expected rate of return implies. It implies that pension administrators expect to see a doubling of the assets they manage in just under a decade.[33] It implies that a pension's commitment to pay one of its beneficiaries $100,000 in 2030 would be fully funded if the pension had set aside $50,000 in assets in 2020 for that purpose; similarly, it implies that a commitment to provide a beneficiary the same amount in 2040 would be fully funded by $25,000 in assets in 2020. Given the gap between the assumed rates of return and the actual rates of return for state and local pension systems alluded to above, this kind of optimism appears difficult to justify.

Although it is true that the stock market has produced returns of around 7 percent in some past periods, this rate of return is not a realistic one for a typical state and local pension plan for several reasons. First, as discussed in the "Future Headwinds Facing Pension Growth" section above, there is a significant possibility that equity investments will have lower-than-average rates of return over the next decade. Second, pension administrators must, as a practical matter, invest in a balanced portfolio that contains some portion of fixed-income investments; pensions must be paid out on a regular basis, which requires the use of financial instruments like bonds that can serve as volatility buffers to moderate occasional losses from equity markets and alternative investments. Third (and relatedly), because pension administrators are not allowed to pass the risk of underperforming investments onto pension beneficiaries, they must set their assumed rate of return near to or lower than their real-world investment goal. In short, given the significant potential that a typical pension will fail to achieve a rate of return of 7.19%, this estimate is likely overly optimistic for several reasons.

Professor Joshua D. Rauh of the Stanford Graduate School of Business[34] has emphasized the tension between the accounting used by pension administrators and a common-sense understanding of asset valuations:

> *As an example, consider an individual who borrows $100,000 due in ten years at 0 percent interest. The individual spends half of the funds today on discretionary spending, such as a trip around the world. The remaining $50,000 is placed in a portfolio of stocks and bonds, which historically has had returns of around 7.5 percent, and these funds are in a dedicated trust to pay off the debt. The individual then goes to a bank to take out a mortgage on his house and is asked to disclose all his assets and liabilities. [The] … concept of expected return discount is equivalent to this individual stating that his net debts are zero, on the grounds that the $50,000 is presumed to double to $100,000 in ten years to pay off the $100,000 debt. Of course, an individual who neglected to disclose this arrangement would have committed financial fraud, but a government with $50,000 in assets to pay a $100,000 pension payment in ten years is allowed to declare this promise to be "fully funded."*[35]

As Rauh notes, this kind of accounting risks understating the actual magnitude of unfunded pension liabilities. More precisely, it encourages a dynamic in which the present value of future obligations is underestimated, because the standards that govern pension accounting allow a significant portion of public debt to remain invisible because high rates of return are assumed. The ultimate consequences of such underestimation likely include state and local pension underfunding, and the ultimate consequences of such underfunding likely include the recruitment of state and local taxpayers to make up some or all of the difference.

This Report, therefore, discusses some alternative methods of measurement immediately below that take into account some of the concerns described above.

The Spectrum of Measurements of Unfunded Pension Liability

> *Facts all come with points of view; facts don't do what I want them to.*
>
> *- Talking Heads, "Crosseyed and Painless"*

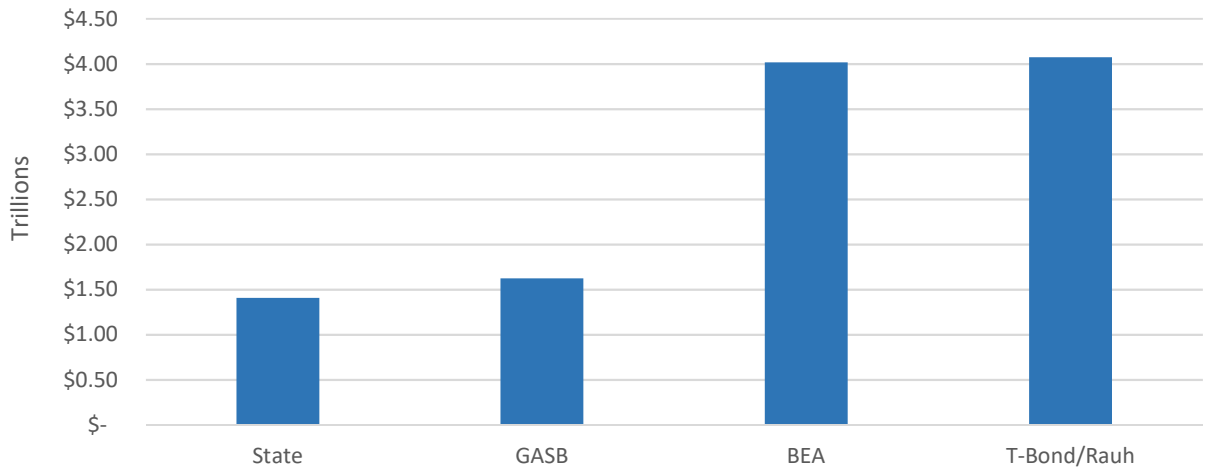
This section of the Report discusses the nature and consequences of four different sets of methodological choices — one might think of them as yardsticks — to estimate unfunded pension liabilities.

- *Measurements Based on State Actuarial Figures.* Each state or local pension system contracts with an actuary to estimate the present value of its future pension liabilities and the current value of its assets to monitor the health of its defined benefit pension plans. In some cases, the figures that are generated have little or no independent verification; methodological variance across jurisdictions in these measurements may provide some justification for skepticism about their usefulness. The nature and the results of this method of measurement are discussed at some length in Chapter 2 above.
- *Measurements Based on Government Accounting Standards Board 67 (GASB) Reports.* The Government Accounting Standards Board (GASB), a private organization that establishes generally accepted accounting principles used by state and local governments, recommends that states file a GASB 67 report to estimate the soundness of their pension systems. In the past, GASB allowed states to calculate the present value of their pension liabilities using a discount rate equal to their expected investment returns — a figure that typically ranged from 7 percent to 8 percent. However, as unfunded liabilities ballooned after the 2008 financial crisis, GASB came under pressure to change its requirements so that pensions would be encouraged to use a lower discount rate in the course of reporting their status. In 2012, GASB updated its guidance for the reporting and measurement of public pension plan information; the new guidance requires the use of a blended discount rate for estimating liabilities. This blended rate consists of (1) the expected rate of return for the portion of liabilities that would be funded by the hypothetical

expected rate on assets and (2) a municipal bond index rate for the balance of the liabilities. As a practical matter, this measurement does not bring conformity across plans because plans still use different discount rates for the portion of liabilities that would be funded by investment returns at those rates. While this change had a relatively small effect on projected unfunded pension liabilities for most states (as compared to self-assessed state figures), some states — particularly those with significant unfunded liabilities — saw a significant increase in their estimated liabilities. Although the use of the GASB 67 form is not required, all 50 states file reports each year that use and rest on GASB 67 standards.

- *Measurements Based on Calculations of the U.S. Bureau of Economic Analysis.* The U.S. Bureau of Economic Analysis (BEA) uses the AAA corporate bond yield published by the Federal Reserve Board as its discount rate for public sector pension plans, which provides something like a median method between varying methods of measurement. BEA does not adjust its rates more than once per three-year period.
- *Measurements Based on Adjusted Treasury Bond Yields.* As discussed above, Professor Rauh is a leading proponent of the Treasury bond yield method of measurement; he uses this yield as the discount rate for his projection of unfunded liabilities in public sector pension plans. Because these pensions are guaranteed by states, which implies that the risk of default is minimal, he has argued that they should be valued like Treasury bonds. Professor Rauh, like many other financial economists in this field, adjusts discount rates on a plan-by-plan basis based on their duration and convexity (in layman's terms, these adjustments account for the impact that changes in interest rates have on the value of a plan's liabilities). Notably, he also adjusts pension liabilities only to account for benefit obligations that have already been accumulated, rather than those that are projected to be earned in the future. Because of this adjustment, although Rauh's method of measurement has the lowest discount rate of the various methods of measurement analyzed in this report, some states' unfunded liabilities are lower under Rauh's method of measurement than they are under other methods.

Figure 11: National Unfunded Pension Liabilities by Methodology (Plan Year 2017)



As might be expected, these varying methods of measurement produce dramatically different results, some of which make the state self-assessment figures in Chapter 2 appear highly optimistic. For instance, as can be seen in Figure 11,[36] the sum of all of these self-reported state and local unfunded pension liabilities is roughly $1.4 trillion. If GASB reporting standards are required, total unfunded pension liabilities are over $1.6 trillion — and calculations based on USBEA metrics or Rauh's treasury-bond-based system of valuation nearly triple these unfunded pension liabilities, catapulting them to a sum of over $4 trillion in each case.

Figure 12: National Pension Funding Ratio by Methodology
(Plan Year 2017)

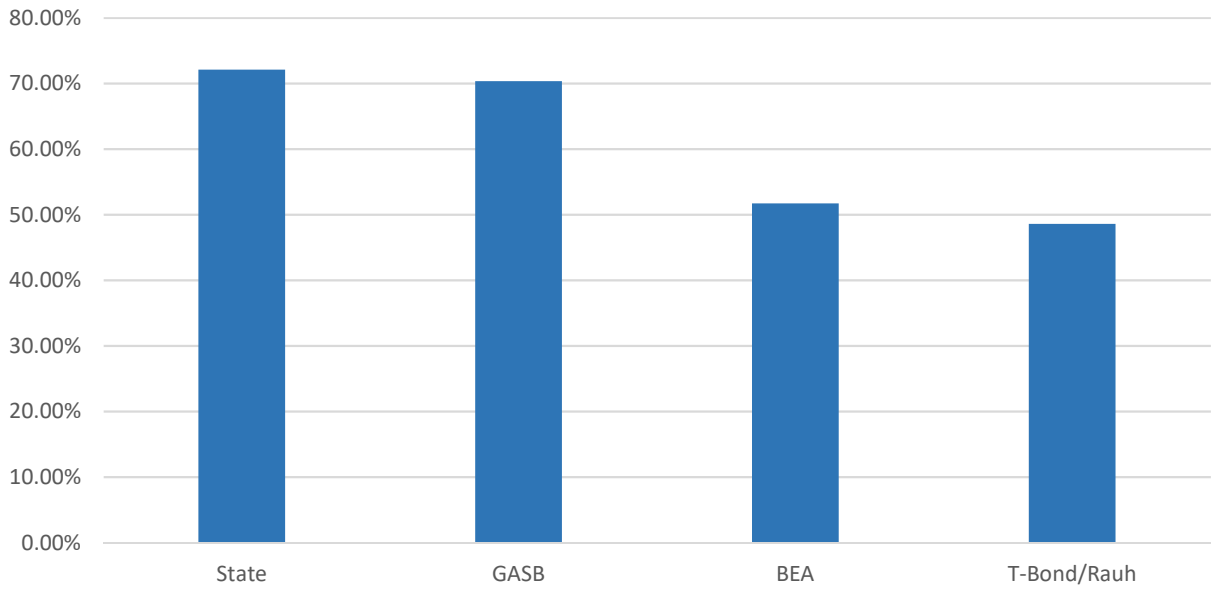


Figure 12 illustrates a similar dynamic;[37] when total state and local pension liabilities are compared to total assets, the assumptions used by Professor Rauh and USBEA suggest a much larger overhang. The average funding ratio for state and local pensions is just above 70 percent as measured by the states themselves, whether or not GASB constraints are taken into account. However, USBEA's evaluations, and those of Professor Rauh, suggest that the average funding ratio for state and local pensions is, respectively, just above or just below 50 percent. To put it plainly, these latter two measurements suggest that these pensions hold almost exactly half the money they need to pay what they owe to their beneficiaries.

These four methods of measuring unfunded pension liabilities can all be used to calculate each state's pension debt, as well as a per-person pension-debt figure for each state that may better illuminate the weight of unfunded pension liabilities. The total and per capita unfunded pension liabilities of each state for each of these measures are available in this Report's Appendix B.

What is the best measure to use to calculate unfunded pension liabilities? This question is difficult to answer conclusively because the varying metrics serve varying purposes. At a

minimum, state and local governments should communicate the verdicts of *multiple* measures to the public in plain language. Among other things, this policy might force public discussion of the variety of ways that the problem is measured — and would lead to a fuller appreciation that, by any measure, many states' unfunded pension liabilities are large enough to have a punishing effect on government budgets, public employee compensation, and ultimately state and local taxpayers.

Chapter 4: Institutional Pressures and Opportunity Costs

The Unique Pressures Faced by State and Local Pensions

> *Imagine having a 30-year mortgage and each year, instead of making your mortgage payments and having 29 years of payments left, you simply re-amortize the remaining liability over another 30-year period … Using this approach, you can manufacture lower amortization payments for yourself, but you will not eliminate the underlying liability … That's called open-ended amortization, and despite being an unscrupulous accounting practice, it is widespread among state pension plans.*[38]
>
> *- Jeff Diebold, North Carolina State University assistant professor, 6/9/17*

As Pierre Mendes-France famously observed, "To govern is to choose." In an ideal world, the choices of government policymakers would always be impartial and enlightened, motivated only by the public interest. In the real world, however, government decisions are more often subject to pressures that can pit one private interest against another. At a very general level, many problems of state and local pension administration may very well arise because the plans are established and overseen by political officials; the decisions of those officials have disproportionate consequences on the public employees who constitute an important voting constituency. This, in turn, subjects the plans to pressures that can threaten good accounting practices as well as responsible plan governance. A discussion of some of these pressures follows.

Temporal Pressures

> *You're gonna pay me now or you're going to pay me later. And it's going to be more if you pay me later.*[39]
>
> *- Tim O'Brien, chair of the Colorado Public Employees' Retirement Association, 6/22/20*

State pension policies that have the effect of favoring current interests over future interests are sometimes the result of special-interest pressures. This results partly from the fact that parties who favor policies that disproportionately benefit the current generation have a structural advantage when lobbying pension administrators; others who might favor policies that benefit future generations are less likely to be present and therefore less likely to be able to lobby (they aren't present because, for instance, some of them aren't born yet). The academic literature often uses the label "intergenerational equity" to describe such concerns.[40]

A pension system that restructures its debt in order to create a longer payment schedule may thus be subject to temporal pressures that are at odds with the general interest. Pension administrators who opt for debt restructuring to produce longer amortization schedules typically make this choice in order to avoid near-term debt burdens. But stretching out debt is costly: the danger of such amortization is that it increases the sum of all debt payments over the long term. Such increases can lift burdens from taxpayers and policymakers in the near term, but only by creating much weightier burdens on their future counterparts.

Pension managers who invest in risky assets run the same risk of acceding to temporal pressures at the expense of the general interest. Every incremental increase in the discount rate that lowers the measurement of liabilities allows for lower annual contributions and a corresponding reduction in current pension assets. Once again, this kind of decision can temporarily ease the burden on taxpayers today, but it may also increase the risk that the pension in question will not be fully funded in the future. Notably, the decision to use higher discount rates implies two poor choices: it will either require pension administrators to load up investment portfolios with assets that carry higher risk, or it will require pension administrators to maintain a current asset mix which seems unlikely to satisfy the plan's assumed rate of return. Both scenarios increase the likelihood of an unattractive outcome: a pension default.

Another consequence of temporal pressures can be observed when policymakers make budget choices that underpay what is actuarially required to cover pension liabilities; these

choices result in expanding unfunded pension liabilities over the long run and leaving larger budget holes for future policymakers to fill.

Governments have resorted to a variety of financial maneuvers to deal with their unfunded pension liabilities. For example, pension obligation bonds are used to trade away the relatively flexible pension contribution obligations that governments bear today in exchange for stricter debt obligations in the future.[41] However, this choice neither shrinks these obligations nor jettisons them.

In short, these temporal maneuvers by pension policymakers and administrators bear some resemblance to the choice of a child who, when told to eat her vegetables, instead resorts to moving them around on her dinner plate. This buys time — but it makes the vegetables no more appetizing, and they must still be eaten.

Representational Pressures

> *Retirement board members start seeing themselves as advocates and representatives of the constituencies that put them on the board rather than as a collective of fiduciaries working for the common goal of funding promised benefits.*[42]
>
> *- Harvey L. Leiderman, partner at Reed Smith LLP, 1/13/20*

Many pension administrators are trustees who are chosen in elections in which only beneficiaries can vote. This often leads to schoolteachers electing schoolteachers, state employees electing state employees, and so forth. That political structure ensures that beneficiaries as such are well-represented on boards; it is less successful at producing pension managers with the kind of financial and technical acumen that is needed to make sophisticated investment decisions about pension trust holdings that are worth billions of dollars. It may also further weight decisions in favor of current participants as compared to future participants or taxpayers. As a general matter, the investment performance of pension boards containing a relatively high proportion of member-elected trustees is significantly lower than the norm.[43] Relatedly, Boston College's Center for Retirement Research found a positive relationship between plans' investment returns and the presence

of board members with investment or actuarial expertise.[44] Board representation that focuses on the demographic qualifications of trustees at the expense of expertise in making complex financial decisions is likely not in the best interest of beneficiaries.

Ideological Pressures

> *I've been involved in five divestments for our fund. [On] all five of them we've lost money, and all five of them have not brought about social change.*[45]
>
> *- Christopher Ailman, chief investment officer, California State Teachers Employees Retirement System, 2015*

Pension administrators must necessarily make choices about the investment strategies that pensions should pursue, and the principal determinant of those strategies should be the investment choices that best further the interests of pension beneficiaries. Pension administrators often face pressures to divest pension plans of assets that some see as controversial (for instance, assets related to firearms, tobacco, energy production, and so forth), but acceding to such pressures may jeopardize the ability of pension portfolios to capture value in a way that furthers the interests of pension participants. Using pension investment choices to further social or political goals — behavior that is often referred to as environmental, social, and governance investing, or ESG — is in significant tension with the obligations that state and local pensions have to plan participants; speaking generally, pension systems are supposed to serve as agents of and fiduciaries to their beneficiaries by loyally and conscientiously advancing the beneficiaries' financial interests. An investment strategy that treats pension assets as a tool for advancing policy goals distracts pension administrators from their duty to maximize investment returns and minimize risk so as to enhance retirement security for pension participants.

Perhaps the best-known case of principal-agent problems caused by ESG-style motivations is the decision of the nation's largest public pension fund, the California Public Employees' Retirement System (CalPERS), to divest its investments in tobacco companies.[46] When CalPERS's board voted unanimously to sell off over $670 million in tobacco stocks in 2000,

its representatives argued that the health consequences of tobacco use made tobacco divestment morally obligatory. A staff review of CalPERS's decision found that this divestment decision cost the plan over $3 billion in asset appreciation. In 2016, CalPERS voted to extend its tobacco divestment policy to funds held by outside investment managers, even though its own analysts pointed out that this policy undercut the interests of pension plan participants. Staff analysis suggests that the total value lost by ESG-style CalPERS divestment is in the neighborhood of $8 billion.[47]

In short, assigning weight to politicized, non-pecuniary analysis in investment decisions not only raises questions with respect to plan administrators' fiduciary duties, but also appears likely to lead to bad consequences. Consider the experience of the Retirement Systems of Alabama; its administrators chose to make sizable in-state pension fund investments with the express goal of fostering local economic development, even while admitting that those particular investments would provide sub-par performance for pension beneficiaries.[48] Its pension administrators made politically popular decisions to opt for investment vehicles like local golf courses and luxury hotels; it is unclear, however, to what extent the pension's beneficiaries appreciated that their interests had been discounted. An ESG strategy also appears impractical: orthodox economic theory would predict that investors who are seeking high returns would buy the valuable assets that ESG investment strategists sell or ignore.[49]

A comprehensive survey by the Center for Retirement Research of 176 pension plans in its Public Plans Database over the last 20 years uncovered an unfortunate correlation between ESG strategies and lower rates of return in pension investments.[50] About two-thirds of the pension plans in the survey database either have adopted ESG policies on their own initiative or were mandated to adopt them by legislative bodies. The survey discovered a statistically significant, negative relationship between pensions' rates of returns and ESG state mandates. The survey also found some evidence of a causal relationship; state mandates and ESG policies both appear to reduce annual returns by 70 to 90 basis points. The study's authors highlight the fact that the fees of ESG funds are significantly higher than the fees of the Vanguard funds that served as part of the basis of comparison; the

Vanguard funds generally outperformed the ESG funds, suggesting that ESG investors are generally paying higher costs for worse performances.

The U.S. Department of Labor released a final rule[51] in October of 2020 that codified fiduciary standards under the Employee Retirement Income Security Act (ERISA) of 1974 for private-sector pension plan investments; the rule addresses investment strategies that promote non-pecuniary objectives (such as, for instance, ESG strategies), underscoring the duty of plan fiduciaries to treat the financial interests of plan participants and beneficiaries as paramount. This rule does not apply to state and local government pensions, however, some of which (as shown in this Report) are among the most financially troubled.

Political Pressures

> *Public sector unions are the leading forces of opposition to any change that might reduce the generosity of existing plans. As political alignments form over these issues, the unions' stand has been remarkably consistent and predictable: make every effort to block reform.*[52]
>
> *- Daniel DiSalvo, Government Against Itself (2015)*

The American theory of representative government rests on the idea that public officials are charged to make decisions on the merits. However, the lobbying of public employee unions on retirement policy has sometimes threatened sound plan governance.

Consider the experience of California: before the "Great Recession" of 2007-2009, California had granted public employees increasingly lavish pension benefits – and had spurred increasingly underfunded pension balances — for decades. California's growth in pension entitlements is perhaps best symbolized by legislation then-Gov. Gray Davis signed in 1999 and 2001, which increased state workers' retirement benefits, made the pension benefit formula more favorable for pension participants, and boosted both survivor benefits and current retiree benefits. In California, representatives for public employee unions are powerful actors in both the electoral and legislative process; one observer, analyst Steve Malanga, argued that the board of CalPERS itself "became an outright lobbyist

for higher member benefits"[53] in the legislative battle to pass those bills. Public workers chose six of CalPERS's thirteen members (often electing senior labor officials); California's treasurer and controller, who are statewide elected officials, make for another two board members; the governor appoints another two. As the *New York Times* noted in a discussion of public-union politics, the CalPERS board wore "the union label."[54]

The CalPERS board lobbied hard for the passage of these generous measures, arguing that the state could create lavish additional benefits at zero additional cost: it claimed that "no increase over current employer contributions is needed for these benefit contributions."[55] Regrettably, the recessions of the first decade of the 21st century forced California state budget decision-makers to increase taxpayer contributions to pensions significantly, which starved other public programs; when pension funds failed to achieve predicted returns, taxpayers were forced to pump another $27 billion into pension systems to make up for the shortfall. Relatively mild efforts to reform the system in recent years — for instance, then-Gov. Jerry Brown's attempt to add two additional members to CalPERS's board with finance credentials — were rejected by California legislators, who remained resistant to reforms to the state's retirement systems.

The influence of special-interest politics on pension policy is hardly limited to California. For nearly ten years, the New York state legislature relied on estimates from an actuary, Jonathan Schwartz, to determine the impact of every proposed pension reform. Schwartz was simultaneously on the payroll of multiple public sector unions representing teachers, firefighters, police officers, prison guards, transit officers, and other public workers.[56] When Schwartz was asked to explain his estimation methods, he explained: "Back in my days as a city actuary, I would go to that part of the range that would make things look as expensive as possible. As consultant for the unions, I go to the part of the range that makes things as cheap as possible, but I never knowingly go out of the range."[57] The *New York Times* concluded that Schwartz's estimates cost the city of New York roughly $500 million.[58]

Anecdotes such as these could be multiplied extensively. What is most appropriately highlighted here is the unique dynamic of negotiations between public-sector unions and

government managers who may have depended on those unions' support for their election. Such interactions can be prone to result in decisions that pay a great deal of attention to certain private interests at the expense of the broader public interest, and these decisions can appropriately be viewed as governance failures.

Glimpses of the Status Quo — and Its Alternatives

> *In 2014, to help close the staggering $75 billion funding gap in its teacher pension system, the state [of California] directed school districts to significantly increase their contributions. At the time, districts spent an average of $500 per pupil on pensions; in 2020, they'll be contributing an average of $1,600 per pupil.*[59]
>
> *- Arun Ramanathan and Christopher Edley Jr., 6/10/19*

The impact of trillions of dollars in unfunded pension liability on everyday life is difficult to perceive. But some analysts have provided a closer look at how unfunded pension liabilities manifest themselves in the real world — and how the world would change in the absence of these opportunity costs. Consider the results of a 2019 paper by Professor Marguerite Roza that focused on the impact of unfunded teacher pension liability on public schools.[60]

Roza examined the impact of unfunded liability on teacher pensions (and, more broadly, on education budgets) in six states; she chose those six states to illustrate the range of the pension debts that have been incurred. As described in chapter 3 above, the calculation of pension debt can be controversial; the assumptions Roza used are at the relatively cautious end of the spectrum (that is, her assumptions produce relatively small estimates of unfunded pension liabilities). Roza's calculations show that if the states were able to pay off their pension debts immediately, this could have extraordinarily fruitful consequences for education budgets — more precisely, it would open up opportunities to devote additional funds in education budgets to students and pay teachers. The budget status quo destroys these opportunities; the funds in question are being diverted to pay off pension debts.

Figure 13

(Plan Year 2018)

State	Current Pension Debt Per K-12 Student	For the Same Cost as Paying Off Their Pension Debt in 10 years, States Could Raise School Funding Per-Student By:
California	$10,206	$1,452
Illinois*	$39,820	$5,676
Louisiana	$9,804	$1,392
South Carolina	$9,217	$1,308
Texas	$2,733	$384
Vermont	$18,696	$2,664

Consider Figure 13,[61] which demonstrates that unfunded teacher pension liabilities have supplanted per-pupil spending of hundreds of dollars (or, in some cases, thousands of dollars) per student.

Figure 14

(Plan Year 2018)

State	Current Pension Debt Per Teacher	Average Teacher Salary	For the Same Cost as Paying Off Their Pension Debt in 10 years, States Could Raise Teachers' Salaries By:	Raise Expressed as Percentage
California	$206,100	$81,136	$29,352	36%
Illinois*	$582,717	$65,776	$83,004	126%
Louisiana	$118,752	$50,256	$16,920	34%
South Carolina	$114,213	$51,027	$16,272	32%
Texas	$36,627	$53,167	$5,220	10%
Vermont	$175,754	$58,527	$25,032	43%

Or consider Figure 14, which demonstrates that unfunded teacher pension liabilities have devoured teacher raises that could have been substantial.[62] In fairness, it should be noted that these calculations assume a present-day payoff of unfunded liabilities, and most states

* Notably, the Illinois calculations in Figures 13 and 14 do *not* include Chicago public schools.

lack the funds to make such a payment immediately. Furthermore, even if we try to understand what it would be like to live in a counterfactual world without these unfunded pension liabilities, it is impossible to know what budget policymakers would do with the surplus: we don't know whether they'd spend more money on teacher salaries, school buildings, or something entirely unrelated to educational needs. The point of these calculations, though, is the opportunity costs that we all now bear because of decisions that expanded unfunded pension liability in the past. Pension costs are competing with spending that could raise teacher salaries or otherwise go to benefit students. More precisely, this is a competition that objectives like raising teacher salaries or otherwise helping students have already lost; these policy goals have been crowded out by mandatory debt service that is needed to pay for past pension decisions.

In Alton, Illinois, the percentage of local property taxes that must go to pay for pensions has increased over the last two decades from 30 percent to 78 percent.[63] That means that less than a quarter of the city budget is available to pay for public services. Alton's pension liabilities have resulted in rising property taxes and a shrinking city population — a dynamic that will be difficult to reverse. Those difficulties are emblematic of the spiraling problems caused by unfunded pension liabilities.

The damage that is created by unfunded pension liabilities cannot be understood simply by looking at the status quo of the states and localities that bear these burdens. One must also consider future opportunities that are foreclosed by these unfunded liabilities. Consider the counsel of Warren Buffett when he was asked how unfunded liabilities might affect the decisions of business investors who are attempting to determine future business locations:

> *If I were relocating into some state that had a huge unfunded pension plan I'm walking into liabilities. 'Cause I mean, who knows whether they're gonna get it from the corporate income tax or my employees — you know, with personal income taxes or what. But that — that liability isn't gonna — you can't ship it offshore or anything like that. And those are big numbers, really big numbers. … the politicians are the ones that really haven't attacked it in a good many states. And when you see what they would have to do — I say to myself, "Why do I wanna build a plant there that has to sit there for 30 or 40 years?" 'Cause I'll be here for the life of the pension plan — and they will come after corporations, they'll come after individuals. They — just — they're gonna have to raise a lotta money.*[64]

As Buffett notes, the problem of unfunded pension liabilities cannot be dealt with by shipping it overseas. And while some of those charged with the administration of state and local pensions have attempted to shift liabilities to future generations, those obligations cannot be postponed indefinitely. A recent article in the *Economist* encapsulated the likely outcome of such procrastination:

> *This is a crisis no one wants to solve, at least not quickly. The Chicago Teachers scheme is aiming for 90% funding, but not until 2059 — long after many retired members will have died. New Jersey's teachers' scheme is not scheduled to be fully funded until 2048. Such promises might as well be dated "the 12th of never". The bill for taxpayers seems certain to rise substantially. For the states with the biggest pension holes, political conflict is in store.*[65]

Chapter 5: Some Snapshots at the State Level

Colorado[66]

> *If we don't address this, the liability grows and it increases the likelihood of crowding out issues in the state budget… We understand that the debt service takes money away from other budget priorities. And paying off the debt isn't as sexy as building a highway.*[67]
>
> *- Jack Tate, Colorado state senator, 3/8/18*

In Colorado, state and local government employees are covered by the Colorado Public Employees' Retirement Association (PERA), which includes five pension systems: the State Division, the Schools Division, the Denver Public Schools Division, the Judicial Division, and the Local Division. The state also has a defined-contribution retirement system, known as PERAChoice.

In 2000, PERA was in strong shape. However, between 2000 and 2019, the system declined from a 105 percent funding rate to a 61.9 percent funding rate. A 2017 study found that if the system's investment returns met expectations, it would take 60 years for the system to reach full funding (a time span well beyond the 30-year amortization schedule set by Colorado law); furthermore, some pension divisions appeared likely to run out of assets within a much shorter period.

As in other states, Colorado's unfunded pension liabilities had multiple causes. For decades, Colorado lawmakers had set a statutory level of debt maintenance that underfunded pension obligations and thus created a growing debt chasm; in effect, this was a long-term choice to deny actuarially sufficient contributions to their retirement system throughout the 21st century. A Reason Foundation analysis concluded that these short payments added up to $4.6 billion in unfunded liabilities. The failure of pension investment portfolios to meet their expected rate of return, as well as off-target predictions about the expected

lifespan of retirees, were also significant factors; the analysis found that these two factors accounted for an additional shortfall of $21.1 billion.

Recessions in 2001 and 2008 had harsh consequences for the state's pension system. In 2010, lawmakers recognized the need to reform PERA and passed legislation to do so. Their legislation included these reforms:

- Limiting the respects in which salary increases can be used to calculate pension benefits;
- Increasing the vesting period for non-vested participants and new hires;
- Reducing benefits for employees who retire early; and
- Temporarily increasing the employee contribution rate.

These 2010 reforms were not comprehensive enough to fix PERA's problems, and PERA continued to accumulate unfunded liabilities. In 2018, legislators passed a bipartisan bill to ameliorate some of the structural problems with Colorado's pension system. These reforms included:

- *Higher contributions by employees*. A gradual increase of employee retirement contributions will result in employees contributing 10 percent of their pay by 2021.
- *Higher contributions by employers.* Employers are also paying more towards retirement, with most now contributing 10.4 percent.
- *Higher state contribution*. The state is mandated to make a yearly supplemental pension payment of $225 million.
- *A trigger for an automatic contribution increase.* If annual payments are not meeting actuarially-defined standards, then contribution rates for employees and employers will automatically increase.
- *A trigger for an automatic cost-of-living (COLA) decrease*. If annual payments are not meeting actuarially-defined standards, then COLAs will decrease incrementally.
- *A temporary two-year suspension of COLAs, followed by the reduction of COLAs after two years.* COLA increases are now capped at 1.5 percent.
- *An increase in the retirement age for newly-hired workers.* The retirement age for workers hired after January 1, 2020, became 64, replacing the previous retirement 60 (58 for teachers). Newly-hired workers must also meet certain standards for years-of-service before receiving a full retirement benefit.
- *Increased options for most public employees to use Colorado's defined-contribution retirement system.* The universe of eligible workers expanded from unclassified state employees to all public employees except teachers.
- *Basing employer and employee contributions on gross compensation.* Previously, these contributions had been based on net compensation.

- *The establishment of a new legislative oversight committee.*

If pension investment returns meet the state's expected 7.25 percent annual return, then PERA will be fully funded within the 30-year time period set by state law. However, as experience has shown, this rate of return may not be realistic. The state's failure to adjust this aspect of PERA suggests a weakness of otherwise salutary reforms.

In fairness, however, to some extent this vulnerability is offset by the automatic adjustments built into the system. In the future, if funding is insufficient to keep Colorado pensions moving towards full funding, then the resultant shortfall is supposed to trigger automatic increases in contributions and automatic decreases in COLAs to help make up any deficiency. This kind of fail-safe mechanism attempts to mitigate policymakers' desires to ignore emerging pension shortfalls or to push present costs into the future. (However, because a past legislature cannot bind a future one, the possibility of state-level policymakers countermanding these policies by making new choices that foil these reforms is always present.)

Illinois[68]

> *We're like a banana republic. We can't manage our money.*[69]
>
> *- Bruce Rauner, governor of Illinois, 6/20/17*

According to a 2020 report by the Pew Charitable Trust, Illinois state pension systems are only 39 percent funded, holding $140.6 billion in unfunded liabilities. With the exception of New Jersey, this makes Illinois's pension systems the most poorly-funded in the nation.

However, other observers argue that the state is in a worse position than it reports. Moody's Investors Service, the financial analysis and research firm that provides widely relied-upon bond ratings, contends that the state's discount rate for its liabilities is too high. Using more conservative assumptions, Moody's estimates the state's pension shortfall at $241 billion. If Moody's figures are relied upon, then Illinois's unfunded pension

liabilities are equal to 500 percent of state revenues. An analyst at JPMorgan Chase & Co. estimated that Illinois would need to set aside 51 percent of its state revenues yearly to fully fund its pension and other post-retirement obligations.

Illinois's official FY2020 state budget summary encapsulates the state's central budget difficulty: Its yearly pension contributions, which are governed by a 1995 statute, are simply insufficient to cover the costs that its yearly pension payouts will incur.

> While the [1995] funding plan sets an ultimate goal of reaching a 90% funding ratio by FY 2045, the systems' unfunded liabilities will continue to grow even if the State makes its statutorily-required contributions in the coming years as the required state contributions are not sufficient to cover both the employer portion of the normal cost and the interest on the unfunded liabilities.

This budget document explains that Illinois's failure to provide sufficient funding is driven by four primary factors:

- Actuarial assumptions have changed;
- The state's demographics have put more strain on the system;
- The state's assumed rate of return was too optimistic; and
- Lawmakers increased benefits in the late 1990s.

The Prairie State's unfunded pension liabilities have grown steadily. In Fiscal Year 2004, for instance, the state's unfunded liabilities (when calculated using Pew's assumptions) were $35.1 billion. In most years, Illinois has failed to make actuarially sufficient payments to its pension fund; nonetheless, it has made — and is still making — payments of substantial size. These payments have grown over time, which has had the inevitable effect of crowding out funding for other public services. Currently, about 25 percent of the Illinois budget is set aside for pension costs — which is to say, as a portion of the budget, pension costs have quintupled over the last two decades.

Illinois policymakers have been on notice about the consequences of unfunded pension liabilities for many years. In 1973, legislators expressed concern that the pension system covering teachers would run out of money in the next decade or two. Lawmakers enacted reforms in the 1990s that were supposed to address some of the long-term issues with

state retirement systems, but those reforms undershot their goals, largely because their architects relied on overly optimistic assumptions about investment rates of return. These reforms were followed by changes to benefits that made them more generous, which reduced the impact of earlier reform efforts.

The economic impact of the coronavirus outbreak made the state's pension situation even worse; some lawmakers are now pleading with the federal government for relief. Illinois Senate President Dan Harmon wrote to the state's congressional delegation earlier this year, urging $10 billion in federal aid for the state's pension program (as well as billions of dollars in aid for other state services).

A prolonged economic slowdown would presumably hobble investment returns, which would have a significant negative effect on the state pension system. An analysis from the Illinois Policy Institute concluded that if an economic recession were to create a 20 percent drop in pension fund asset value, then the state's retirement systems could run out of money within 30 years. A 20 percent drop in fund value due to a recession is hardly unprecedented; that happened during the "Great Recession" of 2007-2009.

As the 2020 general election approached, Gov. J.B. Pritzker proposed a revamp of the state's income tax system to address unfunded pension liability, moving the state from a flat income tax system to a graduated income tax. Illinois voters rejected this option at the polls; the measure failed, 55 percent to 45 percent.

A significant difficulty in achieving consensus on pension reform policies lies in differences of opinion about what sort of pension reforms are permitted under state and federal law. Gov. Pritzker has argued that certain kinds of pension reforms are impermissible under the contracts clause of the federal Constitution (this clause, of course, bars states from impairing certain contractual obligations), going so far as to label some budget reforms a "fantasy" in a public address. Notably, proposals that do not provide a solution to Illinois pensions' underlying or structural difficulties are, quite literally, part of the problem: as pension debt approaches one-third of the state's entire economic product, it will be impossible for taxpayers to provide sufficient funds to cover the current and future structure of pension obligations.

Illinois lacks consensus about how best to address its current pension problems. But there is broad agreement across the political spectrum that Illinois faces a pension crisis. State spending that is devoted to funding the state's pensions has increased significantly, but those pension systems are still facing large unfunded liabilities. Substantial questions remain as to whether Gov. Pritzker's graduated income tax proposals would even have addressed the structural problems of Illinois's pension systems. After the tax proposal was defeated, Pritzker called the state's finances "unsustainable," announcing: "There will be cuts, and they will be painful." Illinois policymakers face a stark situation in dealing with their retirement systems — a situation that appears bereft of attractive solutions.

Michigan[70]

> *Government must not write checks and expect the next generation to pick up the tab. This alone will not deal with our pension issues, but it's a start.*[71]
>
> *- Michigan state representative Thomas Albert*

When compared to other states, Michigan's pension reforms came relatively early. In 1997, Michigan lawmakers established a defined-contribution system for newly-hired state employees. This legislative change did not come about as a result of a looming fiscal crisis; rather, then-Gov. John Engler foresaw that the current system, absent systemic reform, would face long-term problems. Throughout the 1970s and 1980s, legislators and governors in the Wolverine State expanded benefits, increased cost-of-living adjustments, and generally made the retirement system more generous for teachers and other state employees. At the time, these changes imposed little immediate cost on taxpayers, but they triggered the accrual of long-term liabilities.

The 1997 reforms only affected the Michigan State Employee Retirement System (MSERS). Incumbent state employees remained in the defined-benefits system with no changes or increased contributions for many years (Michigan began to require a 4 percent yearly

contribution in 2011). New hires were assigned to a defined-contribution system with the following features:

- The state contributed 4 percent of an employee's salary; furthermore, it matched the employee's contribution up to an additional 3 percent.
- Employees became partially vested in the system after 2 years and fully vested after 4 years.
- Incumbent employees could choose a buyout from the pension system and then have the buyout funds invested in the defined-contribution system.

These reforms have curbed systemic risk that taxpayers otherwise would have borne. However, MSERS still faces significant unfunded liabilities, largely because the state failed to provide additional infusions of actuarially necessary funding after 2002. Nonetheless, that pension system has not faced issues as large as those confronting the Michigan Public School Employee Retirement System (MPSERS), which was not included in the 1997 reforms. In 2000, that system was fully funded, but its long-term problems began to emerge over the decade. In 2010, legislators created a new retirement system for newly-hired workers. It retained a defined benefit system, but with some changes:

- A reduction in the multiplier used to calculate pension benefits from 1.5 percent to 1.25 percent;
- A requirement for employees to work 10 years before being vested;
- Payouts based on a 5-year average, as opposed to a 3-year average;
- Increased employee contributions; and
- No cost-of-living adjustment (COLA).

To replace the COLA, lawmakers added a defined-contribution plan to the system. Employers would contribute up to 1 percent of salary, with employees contributing up to 2 percent.

This hybrid system assumed a high rate of return on investments. The defined-contribution plan estimated a rate of return at 7 percent, while the defined-benefits plan assumed an 8 percent rate of return. These assumptions proved to be too optimistic, causing further problems. For instance, in 2014, 30 percent of Michigan's school systems' payroll costs were devoted to pension contributions. A decade previously, these payments were only 12 percent of these school systems' costs, but because of past underfunding, school employee payroll spending rose.

By 2016, MPSERS's funding ratio was under 60 percent, and it faced over $29 billion in unfunded liabilities. The root of its problems lay in overly optimistic predictions, such as the assumption that pension investments would experience an 8 percent rate of return on assets. Instead, it had experienced a 7.2 percent rate of return over the previous 20 years. Payroll also grew more slowly than expected, chiefly because of Michigan's diminishing population; this had the consequence of a lower-than-expected number of new employees coming (and paying) into the system.

In 2017, Michigan lawmakers enacted reforms to MPSERS aimed at shoring up its solvency. These reforms included:

- Automatically enrolling newly-hired workers in a defined-contribution plan. The default rate for combined employee/employer contributions to that system is 10 percent.
- Giving teachers a choice to enroll in a hybrid defined-contribution/defined-benefit plan like the one previously implemented for state employees. The cost of funding this plan is split evenly between employees and their employers.
- Linking retirement age to mortality tables.
- Providing $250 million to reduce unfunded liabilities.
- Automatically closing the plan to new hires if the funding ratio falls below 85 percent for 2 consecutive years

Legislators undertook another round of pension reform in 2018. These included:

- Gradually ending the amortization schedule. Instead of linking amortization to expected payroll growth, the state's pension system will eventually have an amortization schedule that will more realistically reflect the true cost of its liabilities.
- Reducing the assumed rate of return.
- Providing greater access to annuities.

These reforms were cited by Standard & Poor's when it increased the state's credit rating in 2018.

South Carolina[72]

> *Pensions are made more generous — with high accrual rates, low retirement eligibility ages, generous cost of living provisions — as a means of providing more*

> *generous compensation to state and local employees, without actually needing to pay anything from the current year's budget. Costs are deferred until well after current legislators have themselves retired … [B]ecause the past generosity of pensions had been effectively borrowing from future generations, even if without the explicit label of "debt," there is no money available to shift into better present-day compensation instead.*[73]
>
> *- Elizabeth Bauer, pension analyst, 5/3/18*

Pension systems in South Carolina face serious issues with underfunding. Although legislators have attempted to deal with some of these problems, the system still faces sizable liabilities.

South Carolina has four pension systems:

- The South Carolina Retirement System (SCRS)
- Police Officers Retirement System (PORS)
- Retirement System for Judges and Solicitors (JSRS)
- South Carolina National Guard Supplemental Retirement Plan (SCNG)

SCRS and PORS are the state's major pension plans for state employees; they are the ones facing the most serious problems. In Fiscal Year 2020, SCRS saw its funding ratio decrease from 55% to 54.4%; it had $22.995 billion in unfunded liabilities. PORS also saw its funding ratio decline that fiscal year, from 63.1% to 62.7%, with $2.884 billion in unfunded liabilities.

Legislators passed two major pieces of pension reform legislation in recent years: Act 278 in 2012 and the Retirement System Funding and Administration Act of 2017. These measures require state employees hired after July 1, 2012 to enter a new class (Class Three) in the pension system. Class Three employees:

- Are required to serve more time than other classes of employees before receiving full benefits;
- Have an 8-year vesting period (as opposed to 5 years);
- Receive final compensation based on their highest 20 months of service instead of their highest 12 months; and
- Are unable to receive credit for unused annual or sick leave in benefit calculations.

Current retirees also saw changes as a result of this legislation. These changes included limiting the cost-of-living adjustment to 1% a year (and a $500 yearly maximum) and limiting some payments to retirees who returned to work. The General Assembly retirement system was also ended by the 2012 legislation, with legislators having the option of joining the state retirement system or the state's optional retirement program. South Carolina also made minor changes for other classes of employees, such as eliminating the use of non-mandatory overtime in calculating compensation.

The 2017 legislation did not alter benefits. Instead, it reduced the assumed rate of return from 7.5% to 7.25% while allowing legislators to adjust it in 2021. It also increased the rate of employee and employer contributions. Its final major change was reducing the maximum funding period from 30 years to 20 years.

Even after being addressed in the 2017 legislation, the assumed rate of return in the pension system continues to be a topic of contention. Some experts think the 7.25% rate is still too high. In 2019, State Comptroller Richard Eckstrom advocated that "[l]egislators must accept reality and adopt a more reasonable forecast for the state's investments," but they also failed to take action that year. In Fiscal Year 2020, for instance, SCRS saw a 5.7% rate of return.

Gov. Henry McMaster has proposed going further than adjusting the assumed rate of return. In his 2020 budget message, the governor proposed closing the defined-benefit system to new workers entirely. Under this proposal, workers hired after 2021 would be eligible for the optional retirement program. However, legislators did not act on his proposal.

Chapter 6: Private Pension Plans: Lessons from Experience

> *Taxpayers have a right to decide how much they're willing to spend on the people employed by their municipality or state. Hiding the true cost of that compensation by lowering the pension funding requirements — while simultaneously relying on an unpriced, undisclosed call option on their future earnings to make the math work — is both unfair and undemocratic.*[74]
>
> *- Megan McArdle, journalist, 4/11/17*

This chapter compares three different regimes of pension governance. It begins by describing the funding requirements and fiduciary standards that govern most private-sector retirement plans under ERISA; it then compares those funding requirements and fiduciary standards with those in the relatively lax regulatory regimes that govern state and local pension systems. Third, it explores the corresponding constraints that govern a third class of pensions — private-sector multiemployer pension plans — under ERISA; the comparatively loose institutional guardrails that regulate these multiemployer plans are in many respects more similar to those that govern state and local pensions than to those that govern other plans in the private sector. A number of multiemployer plans also suffer from significant underfunding, compared to the sounder fiscal footing of single-employer private-sector pensions. This chapter concludes with a brief discussion of what state and local pension systems might look like if they were governed by single-employer, private-sector ERISA-style rules; the evidence indicates that stricter funding and fiduciary constraints would lead to better outcomes for state and local pension beneficiaries.

Funding Requirements Under ERISA

The Employee Retirement Income Security Act (ERISA) of 1974 establishes significant funding requirements for most private-sector pensions. ERISA requirements do not apply to state and local government pensions. However, the nation's experience with ERISA may

provide important lessons for state and local public pension policy. The relative health of the nation's single-employer private-sector pension plans, when compared to funding levels in multiemployer private-sector or state and local plans, suggests that the comparatively higher participant protections in place for private single-employer plans, as strengthened by the Pension Protection Act of 2006 (PPA), has been effective at improving the security of benefit promises made under these plans.

In 2006, Congress responded to deteriorating levels of funding in single-employer defined benefit private-sector pension plans by passing a series of reforms to strengthen participant protections and improve the security of benefits promises made in these plans. These reforms included new rules for measuring plan assets and liabilities, stricter contribution requirements for underfunded plans, reduced amortization periods, limits on using credit balances to offset required contributions, and guardrails for underfunded plans. Generally, under PPA, annual pension contributions must be sufficient to cover normal cost and amortize any underfunding over 7 years in level payments.[75] Stricter funding rules are applied to plans at risk of defaulting on their obligations. In the 2006 plan year, 1.5 percent of single-employer plans (that is, 438 plans) were below 40 percent funded when they were measured using the PBGC rate.[76] The most recent PBGC data, plan year 2017, shows that only 0.5 percent of single-employer plans (that is, 117 plans) were below 40 percent funded.[77]

Parallel provisions in ERISA and the Internal Revenue Code (IRC) require employers to make minimum contributions annually to the defined benefit pension plans covering their employees. Generally, pension contributions must be sufficient to cover the present value of expected pension benefits earned in the current year. If a plan's assets are below the present value of pension benefits earned to date, the employer must also contribute an amount that amortizes the funding shortfall. In single-employer plans, this shortfall must be amortized over 7 years.[78]

ERISA and the IRC also require the sponsor of every "at-risk" single-employer plan to increase its employer plan contributions to reflect — and ultimately to cure — its relatively larger funding liability. A plan is considered "at-risk" if it meets three tests: the plan is less

than 80 percent funded using conventional actuarial assumptions; the plan is less than 70 percent funded using statutory hypothetical "at-risk" actuarial assumptions; and the single-employer plans sponsored by the employer and its controlled group have more than 500 participants in the aggregate. The 70 percent funding test assumes that all pension participants who are eligible for benefits during the current plan year and the next 10 years retire at the earliest possible date and choose benefits that result in the highest present value of liabilities. Furthermore, ERISA and the IRC also contain stringent requirements for private sector single-employer retirement plans (as compared to state and local pension plans which are not subject to the funding rules in ERISA or the IRC) in the realm of discount rates. Under ERISA and the IRC, the discount rate used by private sector single-employer plans must be based on the cost of debt — namely, the yield on investment grade corporate bonds in the top three quality levels; however, in practice this rate has been adjusted upwards in recent years.[79] This legal constraint forces private pensions to assign higher costs to future pension obligations by applying lower discount rates; under this system, the prospect of many investment decisions that would involve the compounded accumulation of future pension debt is eliminated.

Underfunded single-employer plans have additional guardrails to prevent severe underfunding. Plans that are less than 60% funded may not promise benefit accruals even to current participants. Plans that cannot meet required contributions generally are required to terminate, with the plan taken over by the Pension Benefit Guaranty Corporation (PBGC), and the employer forced into bankruptcy — which is what generally happens when there is an inability to pay other creditors when payment is due. Participants in plans that are terminated receive benefits that are the greater of either what the plan can afford or the PBGC guarantee level upon the occurrence of the "insurable event" — which is generally termination by PBGC. This protects participants and employers throughout the single-employer program by limiting PBGC's losses and allowing PBGC's guarantee level to be relatively high without needing to charge even higher premiums.

An employer sponsoring a single-employer plan generally bears the risks (to the point of bankruptcy) and has the rewards of a plan's investment returns. The employer has control

over investment policy and the level of pension accruals (if any). Financial regulators recognize that employers are in practice fully liable for any plan underfunding; therefore, they require employers to book the fair market value of any unfunded pension liability on their financial statements. This concentration of control and responsibility provides considerable incentives for employers to keep plans well-funded. Because PBGC does not fully guarantee benefits, participants also have an incentive to see the plan funded. Under PPA, the discount rate used by private sector single-employer plans is the High Quality Market (HQM) Corporate Bond Yield Curve, which is derived from yields on investment grade corporate bonds in the top three quality levels.[80] This guides the payments of single-employer plans to conform to the present value of future pension obligations; expected rates of return on investments are irrelevant to a measurement of the liabilities. Subsequent legislation has provided plans with funding relief by using somewhat higher discount rates. The "Moving Ahead for Progress in the 21st Century Act" (MAP-21) of 2012 permits employers to calculate the present value of future pension obligations by taking into account a 25-year historical average of corporate bond rates, rather than just a 2-year average. This provision will begin to phase out in 2021.[81] Even so, the upper bound for discount rates under current market conditions is materially lower than the typical discount rate used by multiemployer and public pension plans. The current upper bound rate for private-sector plans under MAP-21 stands at 6.5% and is likely to continuously decline over the coming years. State and local pension plans, however, have an average discount rate assumption of 7.19%, nearly 70 basis points higher.

Additionally, private-sector, single-employer plans have significant funding requirements that are not shared by state and local government plans; for instance, the administrators of private-sector plans cannot typically choose to skip contributions when they are underfunded.[82] The Great Recession was accompanied by decisions in many jurisdictions to suspend payments to public pension plans because of significant budget shortfalls. ERISA-covered plans, however, are not generally afforded this option. They cannot suspend their contributions, must check annually for potential underfunding, and are required to quickly increase their contributions when underfunding occurs. This combination of constraints for private-sector plans — lower discount-rate ceilings, requirements to address

underfunding for at-risk plans, and rigorous annual contribution requirements — has no counterpart in public-sector plans.

Single employer plans, on average, were 79% funded as of 2017. PBGC's single-employer insurance program reported a $15.5 billion surplus for FY 2020.

Fiduciary Standards Under ERISA

When Congress created ERISA, it imposed fiduciary duties on persons who exercise authority over plan assets or administration. Speaking very generally, entities with fiduciary duties towards other parties are obliged to put the interests of those other parties ahead of their own. ERISA requires every private-sector pension plan to have one or more fiduciary. Under ERISA, every pension-plan fiduciary is statutorily required to obey four duties to pension beneficiaries: a duty of loyalty, a duty of prudence, a duty to diversify investments, and a duty to follow plan documents.

The duty of loyalty requires fiduciaries to act "solely in the interest of the participants and beneficiaries."[83] The duty of prudence requires fiduciaries to act "with the care, skill, prudence and diligence under the circumstances then prevailing that a prudent man would use in the conduct of an enterprise of like character with like aims."[84] In simplified language, this requires fiduciaries to behave prudently and to conform their conduct and decisions to professional norms. The duty to diversify investments requires fiduciaries to diversify plan assets to "minimize the risk of large losses, unless under the circumstances it is clearly prudent not to do so."[85] By and large, this duty requires beneficiaries to incorporate asset diversification and risk minimization into a prudent pursuit of appropriate rates of return on investments. Finally, the duty to follow plan documents requires fiduciaries to discharge their duties "in accordance with the documents and instruments governing the plan insofar as such documents and instruments are consistent with ERISA."[86] This prevents freelancing and underscores the duty of the agent to his or her principals: it requires keeping accurate, detailed records of investment management agreements, memos, and the possession and disposition of assets. All fiduciaries in charge of ERISA-covered plans must follow these four standards; together, these duties aim to

protect the interests of beneficiaries and to block fiduciaries from abusing the rights and powers that a trust relationship necessarily delegates.

Weak Public-Sector Fiduciary Standards at the State and Local Levels

When Congress passed ERISA, it generally pre-empted state regulation of private-sector plans; however, it did not apply ERISA's fiduciary standards to the retirement plans of state and local governments. Instead, state and local governments have substantial discretion in determining how their plans will be managed. The result is tremendous variance among jurisdictions with respect to pension management structure and duties. Typically, the trustees of a state or local pension plan are chosen by public officials, interest-group representatives, or some combination of both.

For plan administrators so appointed, oversight and accountability measures are generally weaker than for those that govern private plans. Oversight and accountability measures for state and local government plans are best summarized by means of three general propositions:

- First, fiduciary duties — as compared to those of ERISA — are often weak, imprecisely specified in statute, or otherwise indistinct.
- Second, trustees of state and local pensions are often immune from liability for their acts and omissions, as are the pensions themselves.
- Third, litigation that rests on claims of breach of fiduciary duties of state and local pensions is pursued only rarely.

State and Local Fiduciary Duties

In 1997, the National Conference of Commissioners of Uniform State Laws proposed the Uniform Management of Public Employee Retirement Systems Act (UMPERSA). That model act assigns fiduciary duties to persons who manage a retirement system or its assets. It

provides both that they are personally liable to the retirement system for any breach of those duties and that they are personally liable to the retirement system for any profits they made through the use of the retirement system's assets. However, only Wyoming and Maryland have adopted versions of UMPERSA,[87] and very few states have liability provisions as detailed as the model act's. The Illinois Pension Code has a comparable provision,[88] but it has seen little use in litigation.

In a 2014 survey of the funding and governance provisions of twelve state and local pension plans,[89] the authors found that not one of the surveyed plans was subject either to legal requirements or internal guidelines that would require conformity to the UMPERSA model of trustee duties (and consequent trustee liability). All of the surveyed plans required trustees to act in the sole interest of beneficiaries, but provisions for other basic fiduciary responsibilities were often sparse or nonexistent. For instance, few states' laws commanded trustees to act impartially or to limit any costs incurred to those that are reasonable and appropriate; a sole-interest requirement may have relatively little substance unless it is fleshed out through additional definition. A 2016 survey of the 50 states' fiduciary statutes discovered large variance, finding that "the substance of even core obligations may differ from state to state" and that "certain duties also diverge from their equitable tradition."[90] In a few cases, basic fiduciary duties of trustees are not codified: the 2016 survey of statutes found no duty of loyalty for pension trustees in 2 states, no duty of reasonable care for pension trustees in 5 states, and no prudent investor rule in 5 states.

Immunity Provisions

A comprehensive account of trustee immunity under state and local law is beyond the scope of this Report, but immunity appears to be part of the landscape in multiple jurisdictions. Under California law, for instance, employees of a public entity are immune from liability for their acts and omissions, and a public entity is vicariously liable for the acts of its employees only to the extent of their liability. As a result, a county retirement association could not be liable for its board's decision not to sue actuaries for malpractice[91] (but the *actuaries* could be sued for aiding and abetting the county retirement association's

breach of its fiduciary duty to pensioners[92]). Wyoming was one of the two states that adopted UMPERSA, but it departed from the model act to immunize trustees and fiduciaries of the retirement system "except in cases of willful misconduct, intentional torts or illegal acts."[93]

Infrequent Litigation

Due in part, no doubt, to the weak statutory standards and the presence of immunity protections, litigation for fiduciary breach is seldom brought against state or local plan administrators. The authors of the 2014 survey discussed above found that "regardless of the content of a plan's governance provisions, such provisions are almost never effectively enforced."

A Special Case Under ERISA: Multiemployer Pension Plans

An important caveat to the generally sound financial condition of private retirement plans under ERISA is the special case of multiemployer pension plans. Single- and multiemployer pension plans have fundamentally different structures, and they are subject to different rules under ERISA.

Multiemployer pension plans are private-sector pensions sponsored by multiple employers and unions; they are maintained pursuant to a collective bargaining agreement and are intended, in part, to enable union members to carry their pensions with them when moving from one employer to another within an industry. Somewhere between one-tenth and one-fifth of participants in these multiemployer pension plans are beneficiaries of plans that will likely become insolvent in the next two decades. In 2017, 1,398 multiemployer pension plans covered 10.5 million participants; in these plans, for every two participants who were employed and paying into the system, three participants were retired and thus receiving funds from the system.[94] Historical demographic trends, such as declining union

membership, suggest that this lopsided ratio of employees to retirees is likely to become even more imbalanced over time — that is, the portion of employees paying into the system is likely to continue to decrease. Because the nature of a well-funded plan does not imply any particular ratio between active workers and retirees, when such a ratio affects plan funding, this itself can appropriately be viewed as a sign of trouble.

Multiemployer plans are jointly administered and governed by a board of trustees, with labor and management equally represented. The board of trustees normally makes decisions about the plan's benefits structure and rate. The bargaining parties negotiate a contribution rate. The required contributions for employers in multiemployer pension plans are fixed for several years by collective bargaining agreements. However, the Tax Code and ERISA require employers to meet statutory minimum contributions, regardless of the level of contributions agreed to in the collective bargaining agreement.[95]

A significant portion of these plans are in crisis; nearly 10 percent of them have reported that they will run out of money within 20 years.[96] When ERISA-covered multiemployer plans run out of money to pay benefits, they call on the Pension Benefit Guaranty Corporation (PBGC) to provide financial assistance to enable the plan to pay benefits at the guarantee level under the PBGC insurance program.[97]

Multiemployer pension plans are, in theory, supposed to pool risk through joint and several liability, so that the withdrawal of an employer (or a small number of employers) from a plan should not place it in financial jeopardy. Employers who withdraw from the plan are required to make withdrawal liability payments intended to fund a portion of the plan's unfunded benefits. The posture of many multiemployer pension plans has mirrored that of state and local government pensions: in response to strong investment returns in the 1990s, many multiemployer pension plans increased benefits to participants. Many of these plans then became underfunded in the 21st century in periods of financial market retrenchment; industrial and demographic features of these plans made it difficult to dig out from the consequences of the Great Recession. The bankruptcy of some of the firms participating in the plans also contributed to plan underfunding. Withdrawal liability covering the underfunding attributable to other employers might appear unfair[98] and can

also be onerous. Thus, the withdrawal liability rules limit on withdrawal liability depending on past contribution levels. Payment of withdrawal liability in many significantly underfunded plans may not even cover the employer's share of the plan's underfunding, depending on the circumstances, and may also leave plans in worse financial shape.

Multiemployer Funding Rules

Multiemployer pension plans — unlike single-employer pension plans — are not required to use a specified, numerical discount rate to value their future benefit obligations. Instead, multiemployer plans are required to use "reasonable assumptions" to calculate the present value of liabilities. Like public pension plans, multiemployer plans generally discount plan liabilities using the expected rate of return on the plan's assets.[99] Currently, the average discount rate used by multiemployer plans is 7.13 percent. According to the PBGC, 10 percent of plans with the riskiest portfolios discount their liabilities at 7.74 percent. It is difficult to conclude that these are reasonable assumptions for discounting liabilities, as discussed above. Using an expected rate of return on investments to discount liabilities also has other negative consequences, just as in public pension plans. As the Congressional Research Service has suggested, the current funding rules create incentives for multiemployer plans to invest in riskier assets; more particularly, the choice of riskier assets allows plans to project a higher rate of return and use a higher discount rate that artificially lowers the present value of liabilities.[100] Generally, multiemployer plans must amortize funding shortfalls over 15 years.[101]

Previous Guardrails

Before 2006, the employers who sponsored multiemployer plans that could not meet required contributions were subject to an excise tax in the amount of the missed contributions. Employers could avoid this choice between making required contributions or the excise tax by terminating the plan and paying for withdrawal liability, which could

be significantly less expensive than making required contributions. This choice between adequately funding the plan or terminating the plan served as an important guardrail against plans becoming more and more underfunded. It made employers at least partially responsible for underfunding, and it gave employees some incentive to make sure that plans did not become underfunded.

The Removal of Guardrails

As plans became more and more underfunded in the early 2000s, many of their sponsors would likely have chosen to terminate rather than meet required contributions. Termination would have triggered withdrawal liability for employers, which they must put on the books (unlike the case of single-employer plans, sponsors of multiemployer plans are not generally required to book plan underfunding); it might have forced many of them into bankruptcy.[102] Termination would also have stopped new pension accruals. To avoid these results, PPA allows plans that are continuing to deteriorate, no matter how underfunded, to keep promising new benefits, avoid termination, and avoid withdrawal liability for employers, even when the plan runs out of money. To do so, PPA creates a special rule under which plans receive a waiver from required contributions under some circumstances.[103] Thus, contributions from employers are effectively limited to whatever is agreed to by each employer and union in the collective bargaining agreement. Underfunded plans appear to have taken advantage of this discretion to avoid doing what they can to increase contributions. For example, according to PBGC, plans given waivers from the funding rules have had lower contributions per active participant compared to other plans in at some years.[104] Some of the most severely underfunded plans have used these rules to collect contributions from ongoing employers that are less than normal cost (administrative expenses and the cost of new accruals).[105]

PPA was successful in postponing the unraveling of many multiemployer plans, but at the price of dramatically worsening the crisis: plan underfunding skyrocketed and PBGC's deficit exponentially increased. At the beginning of 2007, multiemployer plans were $193 billion underfunded; in 2017 multiemployer plans were $673 billion underfunded. PBGC's

multiemployer program went from a deficit of $739 million in 2006 to a deficit of $63.7 billion in 2020.[106]

When multiemployer plans become cash-insolvent and run out of assets to pay benefits, PBGC provides financial assistance to pay benefits at the PBGC statutory guarantee level. So far, PBGC has not terminated ongoing multiemployer plans. Because of PPA changes, even plans receiving financial assistance from PBGC can continue as ongoing plans that promise new benefits without triggering any specific funding requirement from employers beyond what they agree to in a collective bargaining agreement.

As of 2017, over 75% of multiemployer participants are in plans that are less than 50% funded and over 95% of participants are in plans that are less than 60% funded.

Notwithstanding the application of less stringent funding standards than for single-employers plans, ERISA and the IRC require the multiemployer plan's actuary to annually certify the plan's financial condition as either funded above endangered ("green status"), endangered ("yellow status"), seriously endangered ("orange status"), critical ("red status"), or critical and declining ("deep red status"). The financial condition of a plan deteriorates as funded status moves from green to deep red. Based on this certification, the law requires the plan trustees to adopt a Funding Improvement Plan (FIP) (yellow or orange status) or a Rehabilitation Plan (RP) (red or deep red status) to improve the funding of the plan. FIPs and RPs require increased contributions, reductions in future benefits, or a combination of both. A plan in red or deep red status may reduce or eliminate early retirement benefits, disability benefits not yet in pay status, and other "adjustable benefits." A critical and declining plan (deep red status) may even reduce some benefits in pay status to 110% of the benefits guaranteed by the PBGC.[107]

Currently, the average discount rate assumed by multiemployer plans is 7.13 percent. As discussed in Chapter 3 above, there are substantial questions as to whether a discount rate in this neighborhood is realistic.

Would Better Rules Lead to Better Results?

Single-employer private-sector pension plans generally enjoy better fiscal health than their public-sector and multiemployer counterparts. It is reasonable to conclude that the private, single-employer plan model — given its stricter fiduciary standards, higher funding requirements, and more rigorous determination of discount rates — would improve prospects for sound pension administration and thereby lead to better consequences.

In the past, Congress has periodically considered extending the scope of ERISA so that it would apply to most state and local government pension plans. In the early 1980s, various Members of Congress proposed legislation that would have established federal reporting and disclosure requirements and fiduciary standards for those state and local government plans.[108] A contemporaneous Senate report suggests that these measures failed to advance because of resistance from state and local governments; that report also noted that the Supreme Court's decision in *National League of Cities* v. *Usery* (1976)[109] may have created constitutional concerns.[110] Although that decision was eventually overruled by *Garcia v. San Antonia Metropolitan Transit Authority* (1985),[111] the proper role of federal regulation or oversight in this domain is a weighty issue that would have to be considered fully before extending ERISA to public-sector pension plans.

A detailed analysis of the effects of imposing ERISA-style requirements on state and local pensions is beyond the scope of this Report. But it seems undeniable that if state and local pensions had been required to follow ERISA's funding requirements for private-sector pensions, most jurisdictions would have faced relatively demanding 7-year amortization schedules to cure pension funding shortfalls; ERISA requirements would have barred the lax 15- to 30-year debt projection and amortization schedules that pension administrators routinely rely on; and ERISA requirements would have forced discount rates down and future estimates of outlays up. Compressing a longer series of time payments into a shorter schedule would, of course, require each payment to be larger; a lower discount rate would further increase those payments. Furthermore, a substantial number of those pension systems would likely also be found "at-risk," which would necessitate a more immediate debt reckoning.

In short, the experience of multiple pension sectors appears to demonstrate that application of something like the private-sector, single-plan ERISA regime on state and local pensions would, over time, produce an array of positive effects. Such a regime would have deterred years of imprudent behaviors that created and compounded significant unfunded liabilities. Ultimately, the approach taken by federal law toward private plans would have encouraged policymakers and pension administrators to aim for genuine retirement security for pension beneficiaries.

Chapter 7: Some Principles for Policymakers

> *Unfunded liabilities are a disaster in the making that lurk behind a gray wall of numbers, graphs and pie charts. As Flint and Detroit found out, expecting the problem to recede with an uptick in the stock market or the imposition of a new tax or the wave of a consultant's wand is simply delusional.*[112]
>
> *- Thomas Healey, senior fellow at Harvard's Kennedy School of Government, 6/17/17*

It is challenging to draw general lessons from the experiences of thousands of different state and local pensions, but a few lessons are worth consideration by pension administrators and policymakers.

1. *Address shortfalls in the short term*. As long as they are not addressed, unfunded pension liabilities will magnify through the inevitable dynamics of compound interest. Pension administrators and budget decisionmakers will have to pay down debts that their predecessors have incurred. Increasing the size of debt payments will reduce debt problems; reducing the size of debt payments will defer the day of reckoning at the cost of increasing the pain of that reckoning.
2. *Stop making unrealistic promises*. A pension plan that produces increasingly large benefits will appear increasingly unattractive if it is fueled by increasingly large debts. Actuarial imbalances in pension systems will ultimately lead to budget pain, increased taxing and spending, or broken promises.
3. *Stop offloading debts to the future*. Plenty of pension decisionmakers have tried to shift their debt obligations to the future, but eventually the future arrives with a vengeance.
4. *Create transparency in pension governance*. Many systems of pension governance lack disclosure requirements that would provide the public with a more sophisticated understanding of the costs and benefits of the choices that the administrators make. There is often no transparency requirement that requires the calculation of supplementary pension liability estimates using liabilities that are measured with a lower discount rate. Similarly, there is often no transparency

requirement for the valuation of high-risk, alternative investments; pension managers may end up relying on inflated asset valuations of private equity purchases, which are generally illiquid.

5. *Establish automatic funding adjustments*. Some policymakers have designed pension systems that automatically adjust payments needed to cover pension costs. These adjustments add to the practicality and feasibility of long-term pension administration.
6. *Encourage professionalism*. Some jurisdictions require at least some of their pension trustees to have demonstrable competence in finance or related technical skills. There appears to be a relationship between knowledgeable pension trustees and long-term investment success.
7. *Improve retirement security through actuarially defensible management decisions*. This should be the overall goal of pension administration. A set of incentives that encourage pension administrators and policymakers to undervalue liabilities are at the center of state and local pension problems today. This undervaluing of liabilities encourages policymakers to overpromise future benefits and undercontribute funding to pension plans, which has the perverse but predictable effect of underfunding benefits in the future. As pensions become more and more underfunded, state and local governments must increasingly spend more to cover pension liabilities and ensure future payments for promised benefits; this dynamic crowds out funding for other needs, such as education, transportation infrastructure, health care, and public safety, etc., and threatens citizens with potentially exorbitant tax increases. Policymakers and pension administrators who make decisions by focusing on the provision of retirement security through actuarially sound management decisions can stop the bleeding and end this vicious cycle. (Notably, defined-contribution systems as such are not a panacea that will solve the pension problems of state and local governments; this suggests that policymakers should design systems that focus on pension assumptions, benefits, and amortization and funding methods to advance the ultimate goal of retirement security for pension participants and beneficiaries. The creation of a new defined-

contribution system should be viewed as a means of achieving enhanced retirement security, not simply as an end in itself.)

8. *ERISA reflects a powerful federal model for pension plan management and oversight — areas where many state and local government plans fall grievously short.* State and local officials seeking to better protect pensions should learn from this federal example and consider to what extent the welfare of their constituents might be enhanced by the adoption of similar measures for state and local pensions.

This Report's ultimate goal is to illuminate the pension problems faced by state and local governments, policymakers, and taxpayers. States and localities must ultimately address these problems; they ignore them at their peril.

Appendix A: Notes On Federal Pensions

Cost Savings in Federal Retirement Program Reforms

Many private-sector compensation packages have moved from defined-benefit retirement plans to defined-contribution retirement plans (for instance, 401(k) plans); some public-sector compensation packages are also in the process of making similar changes and moving closer to a world where a defined-contribution retirement plan is the norm. In the mid-20th century, private-sector employers typically carried the costs of pension payout and promised lifetime income for retirees — often with sizable guaranteed annuities that would be sufficient to maintain a retiree's previous standard of living. Those private-sector employers, seeing trends similar to those described earlier in this Report, typically decided to move toward defined-contribution plans. The modern trend in the private sector is a more balanced approach that includes individual employee accounts — an approach that allows each employee to exercise some degree of control over how much money he or she wants to save for retirement. As distinct from a system of defined benefits, there is no specified level of performance or implicit guarantee contained in the retiree's investment results.

The federal government, in its role as an employer, has made similar transitions. The legacy Civil Service Retirement System (CSRS) pension provides retirees with over half of their employee pay; Congress created this pension system for federal civilian employees in 1920 but closed its doors to new entrants in the 1980s.[113] In 1986, the Federal Employees Retirement System (FERS) was created to integrate new federal civilian employees into the Social Security program. FERS provides retirees with about one-third of their employee pay;[114] retirees also receive retirement income streams from Social Security and the federal Thrift Savings Plan (TSP), which provides federal employees with individual 401(k)-like accounts. While the federal employer pays into all three elements, the employer only bears the risk of payout for the FERS pension. Social Security is a separate trust fund managed for

all American workers. TSP accounts are individually owned; contribution levels vary; and account balances are subject to actual investment earnings and market fluctuations.

Congress has continued to adjust the FERS over time. In 2012, the Middle Class Tax Relief and Job Creation Act increased the FERS employee contribution rate for new hires by 2.3 percentage points. In 2013, the Bipartisan Budget Act further increased the FERS employee contribution rate for new hires by an additional 1.3 percentage points. In 2017, the Congressional Budget Office (CBO) projected cash flows for pension benefits and TSP contributions to decline significantly as a percent of gross domestic product (GDP) over the next 75-year period.[115] Two main factors drive this trend down: the transition away from CSRS legacy employee pensions to FERS pensions (FERS benefits cost the government less money[116]) and the diminishing portion of federal civilian employees in the nation's workforce.

Congress has made additional important changes to federal defined benefit plans:

- *Contribution Splits.* New employees currently pay a higher percentage of their salary to prefund future pension benefits than those with greater seniority. That is because Congress has phased in increases to employee contributions over time, with new employees paying more and the federal employer paying less.
- *Retirement Age and Service Requirements.* The minimum retirement age (MRA) was updated to reflect longer life expectancies; the demographic fact of longer life expectancies necessarily creates longer retirement periods and thus a longer and more expensive set of payments to retirees.
- *Cost of Living Adjustment (COLA).* COLAs increase pension payouts on an annual basis to keep pace with inflation. FERS COLAs are capped if the measure of inflation is greater than 2.0 percent.[117] Most retirees under the age of 62 do not receive COLAs. In order to keep up with inflation, employees may choose to work until they are closer to age 62; otherwise, their annuity will lose value over the time they spend in early retirement.

How Federal Employee Choice Drives Federal Retirement Consequences

On average, federal employees are projected to contribute 7.6 percent to their TSP accounts; however, they can elect to change their contribution level at any time to increase or decrease (up to IRS limits) the amount in their paycheck. In contrast, their 4.4 percent contribution to the pension system is mandatory; once employees vest after five years of service, it may be decades before they can access their benefits. As such, defined-benefit plans tend to be valued more by older employees who are closer in time to pension eligibility.

Some younger workers will have different incentives: individual TSP accounts can provide younger workers who leave federal service after 15 years with a higher income replacement rate in retirement (age 62) than their pension. New federal employees who are hired between the ages of 20 and 39 will ultimately receive between one-half and two-thirds (speaking roughly) of their retirement income from TSP. In contrast, new federal employees hired between the ages of 40 and 49 will ultimately receive a larger share of their retirement income from their FERS pension. In TSP, the power of compound interest helps workers who start saving at an early age. The defined benefits of federal pensions favor workers later in their careers — when their earnings are higher, they are closer to retirement age, and inflation does not erode the value of their pension.

In 2017, CBO projected that net federal outflows for retirement benefits would increase by an average of roughly 2.8 percent annually over the next decade (2018-2027), but would rise more slowly than GDP. When CBO took a longer view — over the next 75 years, rather than over the next decade — it found that the government's net cash outflows for the federal civilian retirement system would then decline as a share of GDP — from 0.48 percent of GDP in 2016 to 0.13 percent of GDP in 2091.[118]

CBO projects that defined-benefits outlays from the Federal Employee Retirement System (FERS) will increase annually over the next 10 years, while defined-benefits outlays from the legacy Civil Service Retirement System (CSRS) will slightly decline. The CSRS has been

closed to new participants since 1983 and will ultimately shrink out of existence, with the last cohort projected to leave the federal retirement system by the 2060s.

All current federal workers participate in FERS; the first cohort of retirees with 30 years of service under FERS have recently begun to retire. Because outlays for its defined-benefit plans are not recorded until a pension payment is made, there is a steep increase in cost as more employees retire under FERS. Outlays almost triple between 2018 and 2027, rising from $16 billion to $42 billion annually.

On the other hand, defined-contribution plans are recorded when federal contributions are made to an individual employee's account; their magnitude thus reflects the more steady active federal workforce. CBO projects outlays for defined-contribution TSP accounts to rise at a slower rate between 2018 and 2027 — from $9 billion to $12 billion annually. TSP outlays will drop from over a third of the cost in the new retirement system to roughly one-quarter.[119]

The reader may find the details of this narrative to be overly technical; the bottom line here is that well-designed defined-contribution government pension programs can help beneficiaries achieve retirement security while avoiding the sizable unfunded liabilities that have historically accompanied defined-benefit plans. It is worth repeating, however, that defined-contribution programs do not, as such, provide a solution to the problems that currently plague defined-benefit state and local pension systems. Rather, defined-contribution systems are a retirement plan design that helps policymakers to address what should be the central concerns of a pension system: namely, design features in demographic assumptions, benefit structure, funding mechanisms, and amortization that lead to the protection and enhancement of retirement security for the system's participants and beneficiaries.

Appendix B: Additional Tables and Charts

Figure 15: Unfunded Liabilities by State and Methodology (In Thousands, Plan Year 2019)[120]

State	State Calculations	GASB Calculations	BEA Calculations	T-Bond/Rauh Calculations
ALABAMA	$16,739,071.38	$16,021,429.00	$39,697,643.06	$45,163,792.08
ALASKA	$6,365,777.00	$7,243,004.00	$20,429,293.00	$18,638,846.46
ARIZONA	$27,690,824.64	$18,819,200.00	$57,216,085.12	$55,263,518.73
ARKANSAS	$6,581,219.76	$9,020,281.00	$24,875,807.57	$26,622,599.92
CALIFORNIA	$301,482,935.91	$335,667,315.99	$725,101,349.80	$1,007,137,520.91
COLORADO	$29,744,740.00	$56,105,258.00	$77,395,741.06	$75,176,048.85
CONNECTICUT	$34,411,274.00	$38,011,718.00	$76,045,849.12	$63,835,464.88
DELAWARE	$1,521,195.35	$2,124,185.00	$5,404,547.22	$7,629,354.23
FLORIDA	$29,610,663.37	$36,062,159.00	$120,306,980.21	$139,353,676.35
GEORGIA	$30,105,310.44	$25,725,707.00	$134,495,320.04	$104,769,459.63
HAWAII	$12,928,000.00	$12,950,306.00	$22,203,703.16	$26,274,264.51
IDAHO	$1,766,600.00	$1,506,653.00	$8,235,003.62	$9,581,730.42
ILLINOIS	$169,275,497.59	$195,415,896.00	$469,129,552.61	$238,085,494.12
INDIANA	$16,293,067.58	$17,976,815.00	$27,978,319.61	$37,135,002.69
IOWA	$7,539,058.23	$7,426,761.00	$22,679,028.59	$30,803,351.06
KANSAS	$9,097,495.10	$9,245,333.00	$22,346,047.66	$25,159,775.60
KENTUCKY	$36,998,417.98	$51,048,467.00	$60,826,089.61	$70,819,691.48
LOUISIANA	$20,056,511.17	$23,195,056.00	$50,187,139.84	$53,008,980.45
MAINE	$2,987,658.78	$2,995,589.00	$9,071,023.69	$10,494,447.45
MARYLAND	$19,647,853.42	$26,564,623.00	$68,016,971.86	$75,674,963.64
MASSACHUSETTS	$41,032,104.54	$46,662,945.00	$154,195,283.18	$105,206,517.67
MICHIGAN	$42,097,635.63	$34,935,090.00	$80,745,942.80	$81,375,327.95
MINNESOTA	$16,139,906.00	$37,492,829.00	$63,810,328.11	$71,949,338.39
MISSISSIPPI	$16,802,045.00	$16,783,124.00	$39,103,372.38	$40,951,643.51
MISSOURI	$14,872,174.11	$17,723,680.00	$72,260,164.70	$61,071,281.81
MONTANA	$3,727,681.00	$4,090,728.00	$11,627,337.39	$11,666,490.02
NEBRASKA	$3,299,092.69	$3,226,254.00	$13,668,838.79	$12,947,289.96
NEVADA	$13,266,796.80	$13,299,844.00	$41,274,988.33	$41,099,645.71
NEW HAMPSHIRE	$5,170,099.58	$4,917,992.00	$10,793,066.95	$10,789,473.39
NEW JERSEY	$71,026,737.92	$142,288,432.00	$169,424,326.45	$163,110,874.34
NEW MEXICO	$12,433,397.28	$16,484,872.00	$32,339,636.66	$33,417,772.59

NEW YORK	$85,494,596.00	$76,988,786.00	$269,058,718.97	$303,809,425.30
NORTH CAROLINA	$8,483,230.73	$9,895,443.00	$63,580,784.27	$64,059,743.92
NORTH DAKOTA	$2,456,660.55	$2,987,137.00	$6,724,159.90	$6,673,669.17
OHIO	$55,697,715.23	$52,469,087.00	$162,178,278.25	$155,379,581.13
OKLAHOMA	$7,067,303.40	$8,734,747.00	$23,994,974.73	$25,177,850.32
OREGON	$19,911,300.00	$16,832,900.00	$42,640,856.42	$52,050,612.43
PENNSYLVANIA	$70,704,691.68	$75,738,637.00	$164,538,136.80	$155,739,926.67
RHODE ISLAND	$6,737,779.66	$5,808,499.00	$11,930,434.60	$13,231,710.87
SOUTH CAROLINA	$23,769,951.37	$25,482,182.00	$54,016,144.34	$72,157,224.85
SOUTH DAKOTA	-$39,862.92	-$7,703.00	$4,320,179.21	$5,359,004.98
TENNESSEE	$3,092,479.65	$2,767,864.00	$45,748,412.81	$23,888,549.21
TEXAS	$61,226,521.19	$69,590,307.00	$219,250,473.60	$213,874,289.54
UTAH	$4,011,276.00	$3,420,315.00	$23,968,005.89	$19,254,452.71
VERMONT	$2,408,812.61	$2,373,050.00	$5,270,610.59	$4,887,876.48
VIRGINIA	$22,826,607.33	$25,543,659.00	$71,859,114.83	$71,246,513.78
WASHINGTON	$6,123,600.00	$11,097,554.00	$85,951,531.43	$57,027,334.23
WEST VIRGINIA	$4,284,725.30	$3,918,510.00	$10,453,878.52	$12,050,809.87
WISCONSIN	$1,171,117.18	-$2,005,665.00	$10,880,049.64	$52,153,956.76
WYOMING	$2,273,969.63	$2,700,673.00	$6,895,866.77	$6,841,179.42

Figure 16: Unfunded Per Capita Liabilities by State and Methodology (Plan Year 2019)[121]

State	State Calculations	GASB Calculations	BEA Calculations	T-Bond/Rauh Calculations
ALABAMA	$3,413.92	$3,267.56	$8,096.30	$9,211.11
ALASKA	$8,701.83	$9,900.97	$27,926.23	$25,478.74
ARIZONA	$3,804.36	$2,585.51	$7,860.74	$7,592.48
ARKANSAS	$2,180.80	$2,989.02	$8,243.02	$8,821.85
CALIFORNIA	$7,630.12	$8,495.28	$18,351.32	$25,489.26
COLORADO	$5,165.15	$9,742.63	$13,439.71	$13,054.26
CONNECTICUT	$9,651.75	$10,661.62	$21,329.52	$17,904.72
DELAWARE	$1,562.18	$2,181.42	$5,550.16	$7,834.91
FLORIDA	$1,378.67	$1,679.05	$5,601.47	$6,488.28
GEORGIA	$2,835.46	$2,422.97	$12,667.42	$9,867.69
HAWAII	$9,130.77	$9,146.52	$15,682.00	$18,556.95
IDAHO	$988.55	$843.09	$4,608.12	$5,361.71
ILLINOIS	$13,358.42	$15,421.30	$37,021.48	$18,788.58
INDIANA	$2,420.16	$2,670.27	$4,155.88	$5,516.01
IOWA	$2,389.51	$2,353.91	$7,188.12	$9,763.13
KANSAS	$3,122.73	$3,173.48	$7,670.32	$8,636.14
KENTUCKY	$8,281.36	$11,426.19	$13,614.71	$15,851.58
LOUISIANA	$4,314.35	$4,989.48	$10,795.73	$11,402.74
MAINE	$2,222.61	$2,228.51	$6,748.21	$7,807.14
MARYLAND	$3,249.90	$4,393.98	$11,250.51	$12,517.20
MASSACHUSETTS	$5,953.15	$6,770.10	$22,371.45	$15,263.91
MICHIGAN	$4,215.30	$3,498.11	$8,085.22	$8,148.24
MINNESOTA	$2,861.87	$6,648.10	$11,314.63	$12,757.81
MISSISSIPPI	$5,645.57	$5,639.21	$13,138.92	$13,759.94
MISSOURI	$2,423.19	$2,887.80	$11,773.69	$9,950.63
MONTANA	$3,487.80	$3,827.48	$10,879.09	$10,915.73
NEBRASKA	$1,705.48	$1,667.82	$7,066.16	$6,693.15
NEVADA	$4,307.18	$4,317.91	$13,400.29	$13,343.36
NEW HAMPSHIRE	$3,802.35	$3,616.94	$7,937.77	$7,935.12
NEW JERSEY	$7,996.53	$16,019.52	$19,074.61	$18,363.81
NEW MEXICO	$5,929.62	$7,861.81	$15,423.12	$15,937.29
NEW YORK	$4,394.80	$3,957.57	$13,830.82	$15,617.16
NORTH CAROLINA	$808.84	$943.49	$6,062.19	$6,107.86
NORTH DAKOTA	$3,223.70	$3,919.81	$8,823.64	$8,757.38
OHIO	$4,764.93	$4,488.72	$13,874.32	$13,292.69
OKLAHOMA	$1,786.04	$2,207.43	$6,063.98	$6,362.91

OREGON	$4,720.85	$3,990.98	$10,109.89	$12,340.89
PENNSYLVANIA	$5,522.95	$5,916.16	$12,852.54	$12,165.29
RHODE ISLAND	$6,360.23	$5,483.02	$11,261.92	$12,490.28
SOUTH CAROLINA	$4,616.68	$4,949.23	$10,491.19	$14,014.61
SOUTH DAKOTA	-$45.06	-$8.71	$4,883.44	$6,057.71
TENNESSEE	$452.83	$405.30	$6,698.97	$3,498.01
TEXAS	$2,111.56	$2,400.01	$7,561.44	$7,376.02
UTAH	$1,251.19	$1,066.86	$7,476.08	$6,005.83
VERMONT	$3,860.34	$3,803.03	$8,446.64	$7,833.27
VIRGINIA	$2,674.31	$2,992.63	$8,418.83	$8,347.06
WASHINGTON	$804.16	$1,457.35	$11,287.29	$7,488.92
WEST VIRGINIA	$2,390.83	$2,186.49	$5,833.16	$6,724.23
WISCONSIN	$201.14	-$344.47	$1,868.64	$8,957.41
WYOMING	$3,929.04	$4,666.32	$11,914.92	$11,820.43

Figure 17: Pension Funding Ratio by State and Methodology (Plan Year 2019)[122]

State	State Calculations	GASB Calculations	BEA Calculations	T-Bond/Rauh Calculations
ALABAMA	68.63%	70.45%	50.97%	45.82%
ALASKA	70.36%	66.62%	43.17%	43.68%
ARIZONA	63.07%	67.81%	48.02%	41.77%
ARKANSAS	78.72%	75.76%	54.84%	51.43%
CALIFORNIA	71.20%	73.13%	55.35%	45.47%
COLORADO	61.53%	49.66%	42.25%	42.40%
CONNECTICUT	49.38%	50.32%	37.19%	37.62%
DELAWARE	85.77%	82.07%	67.01%	56.03%
FLORIDA	83.85%	82.90%	62.29%	55.64%
GEORGIA	74.20%	78.52%	44.51%	47.30%
HAWAII	54.87%	54.80%	43.00%	37.40%
IDAHO	89.65%	91.27%	67.03%	62.18%
ILLINOIS	47.39%	45.66%	27.83%	40.82%
INDIANA	61.89%	59.47%	54.05%	41.53%
IOWA	81.40%	82.02%	61.45%	52.37%
KANSAS	67.45%	68.17%	49.22%	44.04%
KENTUCKY	45.54%	37.67%	35.54%	30.35%
LOUISIANA	67.50%	68.93%	51.19%	49.19%
MAINE	81.89%	81.93%	61.48%	56.41%
MARYLAND	73.34%	69.65%	52.71%	44.61%
MASSACHUSETTS	58.18%	60.42%	35.59%	39.85%
MICHIGAN	63.65%	66.08%	53.83%	45.57%
MINNESOTA	79.40%	63.31%	52.27%	47.35%
MISSISSIPPI	61.08%	61.58%	42.35%	39.65%
MISSOURI	80.77%	79.26%	52.54%	52.59%
MONTANA	71.79%	72.86%	50.02%	48.49%
NEBRASKA	79.92%	83.30%	57.64%	55.34%
NEVADA	74.48%	74.42%	49.86%	48.49%
NEW HAMPSHIRE	61.85%	62.66%	45.58%	43.34%
NEW JERSEY	55.09%	35.79%	31.81%	32.72%
NEW MEXICO	68.97%	60.32%	47.50%	44.26%
NEW YORK	84.35%	86.21%	66.31%	61.30%
NORTH CAROLINA	91.58%	90.50%	60.90%	59.53%
NORTH DAKOTA	67.54%	63.78%	46.79%	44.07%
OHIO	76.89%	78.37%	54.07%	55.02%
OKLAHOMA	80.10%	78.11%	58.06%	55.31%

OREGON	75.41%	80.21%	65.51%	56.19%
PENNSYLVANIA	57.10%	55.00%	40.21%	37.28%
RHODE ISLAND	54.67%	58.28%	46.27%	38.01%
SOUTH CAROLINA	57.20%	54.25%	37.36%	29.52%
SOUTH DAKOTA	100.33%	100.06%	74.87%	69.62%
TENNESSEE	94.02%	93.91%	57.28%	64.11%
TEXAS	79.77%	74.63%	55.90%	48.91%
UTAH	87.35%	90.31%	56.89%	62.34%
VERMONT	64.58%	64.24%	46.96%	46.59%
VIRGINIA	76.77%	77.06%	57.14%	54.20%
WASHINGTON	91.20%	89.02%	52.64%	61.21%
WEST VIRGINIA	75.85%	79.23%	60.81%	55.37%
WISCONSIN	98.93%	101.82%	91.16%	68.23%
WYOMING	76.28%	75.91%	54.60%	55.44%

Endnotes

[1] Committee on Finance of the United States Senate (Report by Sen. Orrin Hatch), "State and Local Defined Benefit Pension Plans: The Pension Debt Crisis that Threatens America," January 2012.

[2] Some portion of state and local revenue comes from people and businesses that can relocate to other states.

[3] Jonathan J. Cooper, "Cases Could Open Door to Pension Cuts for California Workers," Associated Press, December 28, 2017.

[4] These figures rely on calculations based on publicly available datasets from the Center for Retirement Research at Boston College, chiefly datasets from its Public Plans Database that capture data between 2001 and 2019 (inclusive).

[5] To be clear, the New York City plan was the first *state or local government pension plan* in the nation's history; federal veterans' pensions date back to the 18th century.

[6] See note 4 above. For each plan year, an average was taken of the actuarially required contribution rates reported by each plan. These averages are reported in Figure 1.

[7] See note 4 above. For each plan year, the total number of active plan members was divided by the number of beneficiaries. These quotients are reported in Figure 2.

[8] Josh B. McGee, "How to Avert A Public-Pension Crisis," *National Affairs,* Summer 2019.

[9] Andrew G. Biggs, "The Growth of Salaries and Benefits in the Federal Government, State and Local Governments and Public Education, 1998-2017," American Enterprise Institute Working Paper 2019-09, April 2019, at Table 3. This paragraph's claims assume that employee benefits as such illuminate the growth of pension benefits. Notably, private-sector salaries have risen faster than public-sector salaries, although not enough to keep pace when total compensation (that is, the sum of salaries and benefits) is measured across sectors; total compensation for private-sector workers rose 38 percent over this period, while state and local public employees saw gains in total compensation of 44 percent and 40 percent respectively.

[10] Anthony Randazzo and Jonathan Moody, "State of Pensions 2020," Equitable Institute, at 9.

[11] See note 4 above. For each plan year, the dollar amount of assets in each investment class was divided by the total amount of assets held in plans reported in the database. These quotients are reported in Figure 3.

[12] Taylor W. Anderson, "Legislators Hold Their Own PERS Hearing, Amid Huge Projected Shortfall," *The Bulletin,* September 22, 2016.

[13] Bill Dudley, "The Fed Is Really Running Out of Firepower," October 28, 2020, https://www.bloomberg.com/opinion/articles/2020-10-28/the-federal-reserve-is-really-running-out-of-firepower

[14] Daryl Purpera, "Our Views: Pension Debts Crowding Out Better School Investments," *The Advocate*, May 20, 2019.

[15] Steven Malanga, "The State Pension Crisis Goes Beyond the Big Blue States," *Wall Street Journal,* May 29, 2020.

[16] Olivia Mitchell, "The Growing Pension Black Hole Is Pulling Us All In, *The Hill,* November 5, 2018. Professor Mitchell's university affiliation is provided for purposes of identification; that affiliation is not intended to imply endorsement by the university of any particular point of view.

[17] Some plans use outdated mortality tables to measure pension liabilities. See Mary Williams Walsh, "Bad Math and a Coming Public Pension Crisis," *New York Times,* July 8, 2015.

[18] For a discussion about the independence of actuaries and the role of actuaries in the public pension crisis, see Jeremy Gold, "Public Pension Crisis: Role of the Actuarial Profession," *In the Public Interest,* January 2016.

[19] See note 4 above. For each plan year, the dollar amount of a state's plan assets was divided by the total of a state's unfunded actuarial accrued liabilities reported in the database. These quotients are reported in Figure 4.

[20] The pensions of police officers and firefighters in the District of Columbia were paid for by the federal government (directly from the U.S. Treasury) on a pay-as-you-go basis for much of the 20th century. In 1979, the federal government began pre-funding these pension benefits. In the late 1990s, the District of Columbia began covering all pension benefits beginning on or after July 1, 1997, while the federal government assumed responsibility for benefits earned before that date. The hybrid nature of the District's pension funding makes comparisons to states unlikely to be meaningful. Notably, however, when analyzing pension data as a national aggregate, this Report does not exclude the District of Columbia's pension assets and liabilities.

[21] See note 4 above. For each plan year, the total of all pension plan assets was divided by the total of all pension plan unfunded actuarial accrued liabilities reported in the database. These quotients are reported in Figure 5.

[22] See note 4 above. For each plan year, the total of all pension plan assets was compared to the total of all pension plan unfunded actuarial accrued liabilities reported in the database. These sums are reported in Figure 6.

[23] See note 4 above. For each plan year, the total of all pension plan unfunded actuarial accrued liabilities reported in the Public Plans Database was adjusted to inflation in terms of 2020 dollars using the Bureau of Labor Statistics's inflation calculator. The results of these calculations are reported in Figure 7.

[24] Keith Greiner and Seth Grove, "Why States Must Address Pension Reform Now, Before It's Too Late," *Washington Times,* December 25, 2019.

[25] See note 4 above.

[26] See note 4 above. Figure 8 was created with data reported by the United States Census Bureau on July 1, 2019 and data reported in Boston College's Center for Retirement Research's Public Plans Database in 2019. Each state's total pension plan unfunded

actuarial accrued liabilities reported in the database for the 2019 plan year was divided by the Census's estimate of that state's population on July 1, 2019.

[27] Brad Branan, "California Cities Get Next Year's Pensions Bill," *Sacramento Bee*, October 13, 2017.

[28] See note 4 above.

[29] See note 4 above. Figure 9 was created using data reported by the United States Census Bureau in 2018 and data reported in Boston College's Center for Retirement Research's Public Plans Database in 2019. Each city's total pension plan unfunded actuarial accrued liabilities reported in the database for the 2019 plan year was divided by the Census' estimate of that city's population in 2018.

[30] https://davidgcrane.medium.com/jerry-brown-v-rob-feckner-on-pension-funding-why-it-matters-e2ae7a96a01e

[31] See note 4 above.

[32] See note 4 above. Figure 10 was created using data from the Federal Reserve and from Boston College's Center for Retirement Research's Public Plans Database between 2001 and 2019. For each plan year, an average was taken of the return assumptions by each plan in the database and compared with the 20-Year Treasury rate reported on January 1 of each year.

[33] A 7.19 percent yearly rate of return on an asset implies that, after ten years, the asset will have more than doubled in size.

[34] Professor Rauh's university affiliation is provided for purposes of identification; that affiliation is not intended to imply endorsement by the university or graduate school of any particular point of view.

[35] Joshua D. Rauh, "Hidden Debt, Hidden Deficits," Hoover Institution.

[36] Figure 11 was created using 2017 data reported by Boston College's Center for Retirement Research's Public Plans Database, GASB Form 67 filings, the United States Bureau of Economic Analysis, and Stanford Professor Joshua D. Rauh in his article, "Hidden Debt, Hidden Deficits."

[37] Figure 12 was created using 2017 data reported by Boston College's Center for Retirement Research's Public Plans Database, GASB Form 67 filings, the United States Bureau of Economic Analysis, and by Stanford Professor Joshua D. Rauh in his article, "Hidden Debt, Hidden Deficits." The total of all reported pension assets was divided by all reported unfunded pension liabilities for each source.

[38] "Most State Pension Plans Paper Over Unfunded Liabilities," press release, North Carolina State University, June 9, 2017. Professor Diebold's university affiliation is provided for purposes of identification; that affiliation is not intended to imply endorsement by the university or graduate school of any particular point of view.

[39] Brian Eason, "Before Coronavirus, PERA Had One of Its Best Years in Decades. Here Are 3 Concerns Going Forward," *Colorado Sun,* June 22, 2020.

[40] See generally Marc Robinson, "Measuring Compliance with the Golden Rule," *Fiscal Studies,* vol. 19, no. 4 (1998), pp. 447-62.

[41] The model of pension obligation bonds is a three-step process: government bond issuance, consequent collection of bond revenue, and transfer of that revenue to pension funds. Pension obligation bonds thus create new assets for a pension's trust fund, as well as new obligations that must eventually be paid. Policymakers that use pension obligation bonds are typically betting that they can profit enough through investments to outrun the costs of paying interest on their pension bonds. The choice to use pension obligation bonds carries special risk for at least two reasons. First, that choice transforms a set of somewhat flexible debt repayment obligations into a series of mandatory, fixed yearly payments. Second, that choice fails to resolve the underlying problem of unfunded pension liability, instead using borrowed money to cover short-term obligations while leaving long-term debt problems alone. At a very general level, one can understand the use of pension obligation bonds as a way to transform implicit pension debt to specified, particularized, and bonded debt. For an interesting discussion of how pension obligation bonds are being used in Southern California cities, see Alix Ollivier, "SoCal Cities Are Spending Big Instead of Preparing for Next Economic Downturn," *Orange County Register*, July 15, 2019.

[42] Arleen Jacobius, "Tackling the Issue of Conflict on Public Fund Boards," *Pensions & Investments*, January 13, 2020.

[43] Aleksandar Andonov et al., "Pension Fund Board Composition and Investment Performance: Evidence from Private Equity," Hoover Institution Economics Working Paper 16104, March 2016.

[44] Jean-Pierre Aubry and Caroline V. Crawford, "Does Public Pension Board Composition Impact Returns?", Center for Retirement Research at Boston College, Number 67, August 2019/updated November 2019.

[45] Editorial, "Pension Funds Put Activism Before Investment Returns," *Orange County Register*, February 15, 2016.

[46] This episode is summarized in "ESG Investing for Public Pensions: Does It Add Financial Value?", Institute for Pension Fund Integrity, September 2018.

[47] "Divestment: The Impact of Political Decisions on Public Pensions," Institute for Pension Fund Integrity, January 2019.

[48] Daniel A. Smith and John A. Dove, "The Economic Consequences of Pension Underfunding: Evidence from the Retirement Systems of Alabama," June 14, 2016.

[49] Evidence for the accuracy of this prediction is hardly confined to orthodox economic theory: the Vitium Global Fund (previously known as the Vice Fund and the Barrier Fund), established in 2002, is a mutual fund with a strategy of buying undervalued assets on the cheap — in particular, companies involved in the production of relatively controversial products and services such as alcohol, arms, tobacco, or gambling — taking advantage of the fact that some controversial stocks have been disqualified from purchase in some circles because of the political views of certain institutional investors. If the goal of ESG investment strategy is to discourage investment in morally controversially assets *generally,* rather than simply discouraging investment in such assets by the set of investors who

subscribe to ESG tenets, the nature of competitive investment markets filled with buyers seeking undervalued goods suggests that this goal is doomed to failure.

[50] Jean-Pierre Aubry et al., "ESG Investing and Public Pensions: An Update," Center for Retirement Research at Boston College, Number 74, October 2020.

[51] 29 CFR Parts 2509 and 2550; RIN 1210-AB95; "Financial Factors in Selecting Plan Investments."

[52] Daniel DiSalvo, *Government Against Itself* (2015), p. 178.

[53] Steve Malanga, "The Pension Fund That Ate California," *City Journal,* vol. 23, no. 1 (Winter 2013).

[54] Mary Williams Walsh, "Calpers Wears Party, or Union, Label," *New York Times,* May 16, 2008.

[55] David Crane, "Taxpayers Covering Legislature's Bad Set," *San Francisco Chronicle,* June 19, 2012.

[56] Danny Hakim, "Unions Bankrolled Analyst Vetting Pension Bill," *New York Times,* May 16, 2008.

[57] Danny Hakim, "Pension off by $500 Million, City Finds," *New York Times,* June 3, 2008.

[58] *Ibid*.

[59] Arun Ramanathan and Christopher Edley Jr., "Unfunded Pensions Are Hurting California Students and Teachers," *San Francisco Chronicle,* June 10, 2019.

[60] Marguerite Roza, "Leaders Ignored Teacher Pension Debt. Now There's Less Money for Teacher Salaries and Students. How Much Less Depends on the State," Edunomics Lab at Georgetown University, November 2019.

[61] *Id.*

[62] *Id.*

[63] www.illinoispolicy.org/nearly-80-percent-of-alton-property-tax-levy-consumed-by-pensions/

[64] www.cnbc.com/2019/02/25/full-transcript-billionaire-investor-warren-buffett-speaks-with-cnbcs-becky-quick-on-squawk-box-today.html

[65] "America's Public-Sector Pension Schemes Are Trillions of Dollars Short," *Economist,* November 14, 2019.

[66] This account of the state's pension system relies on the following sources: Zachary Christensen, "Pension Reform for the New Normal Economy: Examining Colorado's Successful Model," Reason Foundation, October 2020; Geoffrey Johnson, "Colorado PERA 2010 Reform Legislation and Historical Funded Status," Colorado Legislative Counsel Staff, September 28, 2010; Anthony Randazzo et al., "Colorado Adopts Significant Pension Changes for All Public Employees," Reason Foundation, May 25, 2018; "What Has Caused Colorado's Pension Crisis?", Reason Foundation.

[67] Ed Sealover, "Colorado PERA: Legislators Introduce Bipartisan Reform of State's Public Pension System," *Denver Business Journal,* March 8, 2018.

[68] This account of the state's pension system relies on the following sources: Whet Moser, "Illinois Teacher Pensions: Always in Distress Mode," *Chicago Magazine*, March 23, 2011; Bill Reveille, "Illinois Pension Costs, Debt are Growing Faster than State Predicted," Illinois Policy Institute, February 27, 2020; "State of Illinois Budget Summary Fiscal Year 2020," Commission on Government Forecasting and Accountability, August 1, 2019; "The ARC and the Covenants: The State of the States, 2018," JP Morgan Chase, October 9, 2018; "The State Pension Funding Gap: 2018," Pew Charitable Trust, June 11, 2020; Wirepoints Pension Solutions website, https://wirepoints.org/pensionsolutions/

[69] Brooke Singman, "Illinois Careens Into Financial Meltdown – And Not Even The Lottery Is Safe," Foxnews.com, June 20, 2017, www.foxnews.com/politics/illinois-careens-into-financial-meltdown-and-not-even-the-lottery-is-safe

[70] This account of the state's pension system relies on the following sources: "Michigan's Pension Underfunding Problem," Mackinac Center; Anthony Randazzo, "Pension Reform Case Study: Michigan," Reason Foundation, March 2014; Anthony Randazzo and Leonard Gilroy, "Reflections on Michigan's Ongoing Pension Reform Project," Reason Foundation, July 31, 2018; Anthony Randazzo et al., "Michigan Adopts Most Innovative Teacher Pension Reform in the Nation," Reason Foundation, June 16, 2017; "Standard & Poor's Boosts Michigan's Financial and Economic Outlook," Michigan Department of Treasury, August 23, 2018.

[71] Evan Carter, "Done: With School Pension Reform, State's Big Pension Liabilities Contained," *Michigan Capital Confidential,* June 20, 2017, www.michigancapitolconfidential.com/done-with-school-pension-reform-states-big-pension-liabilities-contained

[72] This account of the state's pension system relies on the following sources: Richard Eckstrom, "The Little-Known Number at the Root of S.C.'s Biggest Problem," *Augusta Chronicle*, June 13, 2019; Michael Katz, "South Carolina Governor Calls for Closure of Defined Benefit Pension," *Chief Investment Officer*, January 28, 2020; "South Carolina Police Officers Retirement System," South Carolina Public Employee Benefit Authority, December 4, 2019; "South Carolina Retirement System Actuarial Valuation Report," South Carolina Public Employee Benefit Authority, December 4, 2019; "Past Pension Reform Legislation," South Carolina Public Employee Benefit Authority.

[73] Elizabeth Bauer, "Why Public Pension Pre-Funding Matters (An Explainer)," Forbes.com. April 3, 2018, www.forbes.com/sites/ebauer/2018/04/03/why-public-pension-pre-funding-matters-an-explainer/#b2d2cc65b03c

[74] Megan McArdle, "Don't Mess Around With Government Pensions," Bloomberg.com. April 11, 2017, www.bloomberg.com/opinion/articles/2017-04-11/don-t-mess-around-with-government-pensions

[75] 26 U.S.C 430; ERISA §303.

[76] 2008 PBGC Data Book, Table S-48.

[77] *Ibid.*

[78] 26 U.S.C 430; ERISA §303.

[79] See generally "Pension Plan Valuation: Views on Using Multiple Measures to Offer a More Complete Financial Picture," U.S. Government Accounting Office, GAO-14-264, September 2014.

[80] More specifically, the discount rate as given by the HQM yield curve is based on the corporate cost of debt — namely, the weighted average yields on A-rated, AA-rated, and AAA-rated corporate bonds. Plans were originally required to use a rate tied to the average of the yields in investment grade corporate bonds over the prior 2 years that varies with the timing of future benefits in 3 segments reflecting securities maturing in less than 5 years, between 5 and 20 years, and after 20 years. However, in an effort to give employers funding relief, Congress passed the "Moving Ahead for Progress in the 21st Century Act" (MAP-21). Under MAP-21, this 2-year average may not be less than a minimum nor greater than a maximum based on a 25-year average for the segment. This range widens over time to partially phase out the effect of the 25-year average. While MAP-21 was created to provide only 3 years of relief, Congress passed HAFTA in 2014 and BBA in 2015 to continue the relief. The range is currently set to start widening in 2021. The following chart illustrates the actual and adjusted rates for January 2021. Because the 2-year average rate is less than the adjusted minimum rate, the minimum required contribution is determined using the adjusted minimum rate for each segment:

December 2020	Segment 1 – securities maturing through year 4	Segment 2- securities maturing year 5 through year 20	Segment 3 – securities maturing after year 20
2 year average rate	1.87%	3.12%	3.72%
MAP-21/HAFTA/BBA adjusted minimum rate	3.32%	4.79%	5.47%

[81] Notably, these rates are likely to gradually decline as the high interest rates of the early 1990s are taken out of the calculation and the low interest rates of the last decade remain in it. It is also important to note that MAP-21 only sets the minimum required contribution

for private pensions. Many private pensions fund their pensions at higher levels in order to ensure their solvency and minimize the variable rate premium to PBGC.

[82] However, there are exceptions: sponsors may pursue special waivers that show that skipping payments would be in the interest of all participants, and the recent CARES Act provided a one-time payment holiday.

[83] 29 U.S.C § 1104 (a)(1).

[84] 29 U.S.C § 1104 (a)(1)(b).

[85] 29 U.S.C § 1104 (a)(1)(c).

[86] 29 U.S.C § 11040 (a)(1)(d).

[87] Thomas J. Fitzpatrick IV & Amy B. Monahan, "Who's Afraid of Good Governance? State Fiscal Crises, Public Pension Underfunding, and the Resistance to Governance Reform," 66 *Florida Law Review* 1317, 1335, 1352 (2014).

[88] Ill. Comp. Stat. 5/1-114(a).

[89] Fitzpatrick and Monahan, "Who's Afraid of Good Governance?"

[90] T. Leigh Anenson, "Public Pensions and Fiduciary Law: A View from Equity," 50 *University of Michigan Journal of Legal Reform* 251 (2016).

[91] *Nasrawi v. Buck Consultants, LLC*, 179 Cal. Rptr. 3d 813, 823-24 (Cal. Ct. App. 2014).

[92] *Id.* at 824-26.

[93] Wyo. Stat. Ann. § 9-3-443(e).

[94] John J. Topoleski and Elizabeth A. Myers, "Multiemployer Defined Benefit (DB) Pension Plans: A Primer," Congressional Research Service R43305, April 3, 2020.

[95] As a formal matter, this requirement is somewhat theoretical, post-2006. This requirement to make minimum contributions irrespective of any collective bargaining agreement recognizes (1) the mathematical reality that a contribution rate agreed to by the parties may not be sufficient to fund the plan, and (2) that the bargaining parties, without minimum requirements in the Tax Code and ERISA, may decide not to sufficiently fund the plan.

[96] https://www.pbgc.gov/sites/default/files/fy-2019-projections-report.pdf (at page 2).

[97] The Pension Benefit Guaranty Corporation (PBGC) is a federal agency whose mission is to protect the retirement incomes of over 34 million American workers and retirees in private sector defined benefit pension plans. PBGC was established in 1974 by ERISA to encourage the continuation and maintenance of private sector defined benefit pension plans, provide timely and uninterrupted payment of pension benefits, and keep pension insurance premiums at a minimum. In fiscal year 2020, PBGC paid for monthly retirement benefits, up to a guaranteed maximum, for more than 984,000 retirees in more than 5,000 single-employer plans that cannot pay promised benefits. Including those who have not yet retired and participants in multiemployer plans receiving financial assistance, PBGC is responsible for the current and future pensions of more than 1.5 million people. PBGC operates two separate insurance programs — the Single-Employer and Multiemployer

Insurance Programs. By law, the Multiemployer and Single-Employer Programs are operated and financed separately. Assets from one program cannot be used to support the other program. For its Single-Employer Insurance Program, PBGC collects insurance premiums from employers that sponsor insured single employer pension plans, earns money from investments, and receives funds from the single-employer pension plans it takes over. The PBGC collects premiums from insured multiemployer plans for its Multiemployer Insurance Program and earns money from investments, but does not take over insolvent multiemployer plans. The PBGC multiemployer program is projected to run out of money during Fiscal Year 2026. PBGC receives no federal tax dollars.

[98] However, this could also be viewed as the price for offering benefits at a much lower cost than in single employer plans.

[99] Multiemployer plans are also required to report a second valuation of liabilities using a discount rate between 90% to 105% of a four-year weighted average of 30-year Treasury-bond rates of returns (this is known as the "current liability" standard).

[100] John J. Topoleski and Elizabeth A. Myers, "Multiemployer Defined Benefit (DB) Pension Plans: A Primer."

[101] 26 U.S.C. 431; ERISA § 304.

[102] Withdrawal liability is generally limited to past contribution levels, and employers are therefore not liable to the extent their share of underfunding exceeds that.

[103] More generally, PPA requires the multiemployer plan's actuary to annually certify the plan's financial condition as either not in any special status ("green zone"), endangered status ("yellow zone"), seriously endangered ("orange zone"), critical status ("red zone" – including plans claiming they will be unable to meet required contributions), or critical and declining status ("deep red zone"). This certification depends even more than the prior funding rules over future projections that are inherently uncertain and gives plans considerable flexibility as to which zone they are in. In general, the financial condition of a plan deteriorates as zone status moves from green to deep red. Based on this certification, the law requires the plan trustees to adopt a Funding Improvement Plan (FIP) (yellow or orange zone) or a Rehabilitation Plan (RP) (red or deep red zone) in order to improve the funding of the plan. FIPs and RPs are generally supposed to improve a plan's financial condition by increasing contributions and decreasing future accruals to the extent a plan finds doing so is possible by taking "reasonable measures." A plan in red or deep red status may reduce or eliminate early retirement benefits, disability benefits not yet in pay status, and other "adjustable benefits." Some critical and declining plans (deep red zone) may reduce benefits more generally (except for participants of a certain age) to 110% of the benefits guaranteed by the PBGC upon approval by Treasury

[104] "Multiemployer Pension Plans, Report to Congress Required by the Pension Protection Act of 2006," page 35.

[105] H. Rpt. 116-59, Part 1, Dissenting Views
https://www.congress.gov/116/crpt/hrpt159/CRPT-116hrpt159-pt1.pdf

[106] The deficit would be about $70 billion if not for taxpayer assumption of the unfunded liabilities of one multiemployer pension plan.

[107] 26 U.S.C. 432; ERISA § 305.

[108] H.R. 6525 (96th Congress), H.R. 4928 (97th), H.R. 4929 (97th), and S. 2105 (97th). These bills would have extended the requirements of ERISA to all public employee pension plans except for (a) those covered and not exempted under ERISA; (b) unfunded plans maintained by the employer primarily to provide deferred compensation for select management or highly compensated employees; (c) severance pay plans; (d) certain coverage agreements entered into under the Social Security Act; (e) certain individual retirement accounts or annuities, annuity plans, State deferred compensation plans, and other plans under specified provisions of the Internal Revenue Code; and (e) plans maintained solely to comply with applicable workers' compensation or disability insurance laws.

[109] 426 U.S. 833 (1976).

[110] Special Committee on Aging of the United States Senate, "The Employee Retirement Income Security Act if 1974: The First Decade," S. Prt. 98-221, August 1984, at chapter 2 (E)(3).

[111] 469 U.S. 528 (1985).

[112] Thomas J. Healey, "In the Trenches with Pension Reform." *Milken Institute Review,* January 17, 2017.

[113] For a worker retiring after 30 years of federal service, a CSRS annuity will be equal to 56.25 percent of the average of his or her highest three consecutive years of basic pay. Katelin P. Isaacs, "Federal Employees' Retirement System: The Role of the Thrift Savings Plan," Congressional Research Service RL30387, March 10, 2015.

[114] A worker with 30 years of service retiring at the age of 62 will receive a FERS pension equal to 33 percent of the average of his or her highest three consecutive years of pay. Katelin P. Isaacs, "Federal Employees' Retirement System: The Role of the Thrift Savings Plan."

[115] The Congressional Budget Office projects that under current law, the government's net cash outflows for the federal civilian retirement system would decline as a share of GDP—from 0.48 percent of GDP in 2016 to 0.13 percent of GDP in 2091. Analyzing Social Security cost or benefits is outside the scope of their report. Congressional Budget Office, "Options for Changing the Retirement System for Federal Civilian Workers," August 2017.

[116] The Office of Personnel Management has estimated the current normal cost of CSRS to be 36.6 percent of payroll. OPM estimates the cost of the FERS basic annuity at an amount equal to 18.1 percent of pay for employees first hired before 2013, 18.6 percent for employees first hired in 2013, and 18.8 percent for employees first hired in 2013 or later. "Civil Service Retirement and Disability Fund Annual Report," FY2019, at Table 1.

[117] "The basic retirement annuity is fully indexed to the CPI-W if inflation is under 2% per year and partially indexed if inflation exceeds 2%. If the CPI-W increases by up to 2%, then the FERS annuity increases by the same percentage. If the CPI-W increases by 2% to 3%, the FERS annuity increases by 2%. If the CPI-W increases by more than 3%, the FERS

annuity increases by the rise in the CPI-W minus one percentage point." Katelin P. Isaacs, "Federal Employees' Retirement System: The Role of the Thrift Savings Plan."

[118] "CBO's projections of the cost to the federal government of retirement benefits are based in part on the benefits of current retirees and the salaries of current and incoming employees, supplemented with information on TSP account balances, participation, and contributions from current participants."

[119] More precisely, TSP outlays drop from around 36 percent to around 22 percent of total pension outlays ("total pension outlays" meaning the sum of FERS and TSP outlays) over this period. One might instead calculate total pension outflows (the sum of FERS and TSP outflows), which drop from around 40 percent to around 25 percent over this period.

[120] Figure 15 was created using 2017 data reported by Boston College's Center for Retirement Research's Public Plans Database, GASB Form 67 filings, the United States Bureau of Economic Analysis, and Stanford Professor Joshua D. Rauh in his article, "Hidden Debt, Hidden Deficits." The total of each state's unfunded pension liabilities for each source was reported.

[121] Figure 16 was created using 2019 population data reported by the United States Census Bureau and 2017 data reported by Boston College's Center for Retirement Research's Public Plans Database, GASB Form 67 filings, the United States Bureau of Economic Analysis, and Stanford Professor Joshua D. Rauh in his article, "Hidden Debt, Hidden Deficits." The total of each state's unfunded pension liabilities reported by each source was divided by that state's population.

[122] Figure 17 was created using 2017 data reported by Boston College's Center for Retirement Research's Public Plans Database, GASB Form 67 filings, the United States Bureau of Economic Analysis, and Stanford Professor Joshua D.Rauh in his article, "Hidden Debt, Hidden Deficits." The total of each state's pension assets was divided by its reported unfunded pension liabilities for each source.