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Nearly 300 state and local governments in the United States maintain 451 retirement plans with collective assets of approximately US $1 trillion. These plans cover more than 13,000,000 municipal employees nationwide, in occupations ranging from state troopers and prison wardens to city clerks and school teachers (Zorn and Eitelberg 1994). When a state government's actuaries determine that the present value of plan benefits exceeds the present value of plan assets, the state is said to have an unfunded actuarially accrued liability (UAAL), meaning that it owes money to its retirement plan. Approximately 200 state and local retirement plans are collectively underfunded by more than US $162 billion (Zorn and Eitelberg 1994).

This chapter initially seeks to examine the current funding and investment practices of state and local government retirement plans in a manner designed to provide an introductory discussion for government decisionmakers, taxpayer groups, and municipal employees. In this context the concept of pension funding bonds (PFBs) is introduced as a mechanism for meeting public plans' unfunded liabilities.

When a municipal government owes money to its retirement plan, it typically funds the deficiency, the UAAL, by making amortization payments to its plan each year. In addition to amortizing the principal amount of the UAAL, the municipality must pay interest to its public retirement plan on the outstanding balance of the UAAL at an interest rate set by the plan's actuary. The "actuarially assumed interest rate" attempts to compensate the plan for the opportunity cost of not having money (the UAAL) available to invest in stocks and bonds. In recent years, this rate has typically been set at 8.09 percent (Zorn and Eitelberg 1994).
As an alternative to repaying the UAAL over time at the actuarially assumed interest rate, several municipalities, particularly those in California, have issued pension funding bonds. PFBs are publicly issued securities sold to bond investors in the well-established United States municipal securities marketplace; the proceeds are deposited to the municipal retirement plan to fund the UAAL. Under certain market conditions, bond investors in the municipal securities marketplace will lend funds to the government employer at an interest rate that is lower than the actuarially assumed interest rate, providing substantial savings.

Pension funding bonds are typically backed by the same security as other state and local debt instruments, requiring the governments either to appropriate money annually from generally available funds to pay debt service or to back the bonds directly with dedicated revenue sources, such as property taxes. The funds raised by the PFBs are irrevocably deposited to the state or local government retirement plan and invested by the plan to meet the future retirement needs of its municipal employees.

For example, the City of Fresno, California issued US $245 million of PFBs in March 1994. Fresno borrowed the funds at a 7.5 percent interest rate, deposited the proceeds with the City's retirement system, and hoped that the system would earn a long-term rate of return of at least 7.5 percent over the next twenty years. There were no guarantees that the system would be able to achieve this objective, but the system's actuaries had projected that the system would earn at least 8 percent per year, and the City was paying interest on the US $245 million UAAL at that 8 percent actuarially assumed interest rate. If the system is able to earn 8 percent each year on the invested assets, Fresno will earn US $18 million more over the next twenty years than it would earn as a result of an annual contributions approach. In fact, in the 12 months following the deposit of the additional US $245 million, Fresno's retirement system realized a total return in excess of 20 percent—or a gain of US $50 million on the funds provided by the PFBs. While Fresno benefited from uniquely fortuitous timing and generated savings in excess of its expectations, any public employer that earns a rate of return equal to or greater than its PFB borrowing cost would realize cost savings by funding its retirement plan with PFBs.

However, the potential cost savings, which come with attendant reinvestment risk, need not be the primary motivation for issuing PFBs. Perhaps the strongest argument in favor of PFB issuance is that a municipality's irrevocable obligation to make bond debt service payments may be a more predictable and less discretionary method of funding unfunded liabilities than a voluntary annual contribution. While the mu-
nicipal employer, which is by definition governed by a political body, may choose to postpone or reduce an annual retirement fund contribution, it is unlikely that it would consider defaulting on an annual principal or interest payment due on publicly issued debt. Therefore, PFBs can introduce a higher level of discipline into the plan funding process.

These potential benefits also carry attendant drawbacks. First, if the public plan should fail to earn a long-term rate of return equal to the borrowing cost, such as 7.5 percent, the plan may be worse off than if the employer had continued to make annual contributions to decrease the unfunded liability. It should be noted, however, that even in the absence of PFBs a plan that earns less than its assumed rate of return will become underfunded.

Second, the financial discipline introduced by PFBs also comes at a price—decreased flexibility. While some state constitutions forbid employers from withholding annual contributions or lowering future retirement benefits, other state constitutions do permit such actions. Once PFBs are issued and the proceeds are deposited into the plan, federal law prohibits municipalities from withdrawing funds. Furthermore, bondholders must receive their annual payments or the municipality would be in default.

Furthermore, while it is certainly legal in most states to obligate future legislatures' actions (long-term highway, school, and hospital bonds are issued regularly), the decision to issue long-term debt should be given due consideration as a matter of public policy. One mechanism that somewhat mitigates the decrease in financial flexibility relating to unfunded liability payments is that the municipality may retain the ability to suspend or decrease its future annual contributions even though it would be obligated to pay the debt service on the PFBs.

Finally, taxpayers and elected officials should be aware that all PFBs are not created equal. PFBs need not be structured with level annual debt service payments like a home mortgage. Particularly for large debt issues, principal amortization can be heavily weighted toward the latter maturities, including the use of zero-coupon bonds, or can contain sophisticated embedded derivatives. While these types of bond structures may achieve desired payment patterns, PFB issuers would be well advised to evaluate both the financial risks and intergenerational equity implications of a given PFB amortization pattern.

This chapter focuses exclusively on state and local government employers and public retirement plans in the United States, but the fundamentals of the discussion relating to the creation of unfunded liabilities, the investment of plan assets, and funding plan liabilities by issuing debt securities will hopefully inform discussions in other countries.
Background

Before discussing current funding and investment practices and subsequently examining of PFBs, it will be helpful to make four general observations about public sector plans.

First, each of the fifty states has its own authorizing legislation governing retirement plans. This legislation often specifies contribution practices, actuarial and accounting assumptions, and investment practices. State and local government plans are exempt from nearly all federal legislation relating to retirement plans, including ERISA. Therefore, states are bound only by self-imposed rules relating to funding levels and contributions practices. Readers familiar with United States private-sector pension plans, or retirement plans in other countries, are forewarned to abandon attempts to understand these public plans through the lens of another paradigm.

Second, public sector plans are overwhelmingly defined benefit, necessitating additional employer payments if previous contributions and investment returns are not sufficient to pay benefits. More than 90 percent of public plans are defined benefit, whereas less than 4 percent are strictly defined contribution, and the remaining 6 percent are combinations of the two approaches (Zorn and Eitelberg 1994).

Third, more than 85 percent of the assets of the median municipal plan is invested in publicly traded domestic equities and domestic bonds (Zorn and Eitelberg 1994).

Finally, it is assumed that all state and local governments are experienced issuers of bonds in the capital markets. In fact, more than US $160 billion of municipal debt instruments are issued each year to fund the construction of schools, roads, hospitals, and other public projects.

Current Practices for Determining Public Plan Benefits and Contributions

To understand how PFBs can be used to change contribution mechanisms, it is helpful first to examine the status quo methods for estimating future benefit levels and determining the amount of annual contributions necessary to fund plan liabilities.

Policymakers face three challenges in addressing projected funding shortfalls. First, future benefit levels, which are the liabilities of the retirement plan, are difficult to predict. Second, even if liabilities can be determined with certainty, different funding methods have different consequences for how liabilities are shared between current and future taxpayers. Third, because benefits are practically irrevocable once
granted, employers cannot pursue reductions in plan benefits as a means for matching assets and liabilities.

Plan Liabilities

Defined benefit plans expose municipal employers to significant financial uncertainty due to the possibility that the actual level of benefits paid to retired members may significantly diverge from projections.

Estimated Funding Levels

Paul Zorn and Cathie G. Eitelberg have compiled an excellent database of information about public pension plans for the Public Pension Coordinating Council (PPCC) from the responses of 300 public pension systems (some with multiple retirement plans) that account for more than 75 percent of all public plan membership in the United States (Zorn and Eitelberg 1994). Approximately 200 of the 451 state and local government plans in the PPCC survey are collectively underfunded by more than US $162 billion (Zorn and Eitelberg 1994).

It is helpful to put these liabilities in perspective. The average funding ratio of public plans has increased from 79.8 percent in 1991 to 82.1 percent in 1992 (Zorn and Eitelberg 1994). Only 16 percent of public plans are less than 70 percent funded, while 47 percent are more than 90 percent funded (Zorn and Eitelberg 1994). However, further exploration into the arcane world of actuarial projections reveals that projected plan liabilities are relatively uncertain, and plan valuations change when different actuarial methods and assumptions are used.

Different Actuarial Methods Indicate Different Funding Levels

There are many accepted actuarial methods for forecasting a system's future assets and liabilities, just as an equity can be valued using the cost, market value, or discounted cash flow methods. Describing the differences between actuarial methods, such as the "entry age normal" method and the "projected unit credit" method, is beyond the scope of this chapter. It is sufficient to note that different actuarial methods produce vastly different indications of a plan's funding ratio (the present value of plan assets over the present value of plan liabilities).

The decision to change a plan's actuarial accounting method can have important political implications, as a low funding ratio could require a state to make additional contributions to its retirement plan while a high funding ratio may provide employers with bargaining power to avoid fur-
other increases in employee benefits. It is not uncommon to find jurisdictions with similar local retirement plans (such as adjoining water districts in the same metropolitan area) using different actuarial methods.

Changes in Actuarial Assumptions Affect Funding Levels

Even among plans with the same actuarial method, underlying assumptions can vary widely. One plan may forecast inflation at a 3 percent annual rate of increase, while another may assume a 5 percent annual increase—producing vastly different outcomes. Because federal laws such as ERISA do not apply to public plans, actuarial assumptions can be changed under state or local law, either for sound financial reasons or to obtain politically desirable funding projections and annual contribution levels.

Political Motivations for Changes in Funding Methodologies and Assumptions

Some state and local lawmakers have become proficient at manipulating actuarial assumptions and methods to provide additional retirement benefits without increasing the level of annual contributions during their term of office.

Public employees are a powerful constituency—they are numerous, unionized, have a strong motivation to participate in the democratic process, and perform functions essential to the jurisdiction's well-being. For these reasons, publicly elected officials take employee requests for additional compensation quite seriously. Should the lawmakers agree to increase employee compensation, they may choose to increase either current wages or future pension payments (or a combination of the two.)

State and local governments are required to maintain balanced annual budgets. Therefore, current wage increases would necessitate either cuts in funding for other programs or higher taxes. However, lawmakers may instead choose to grant unfunded retirement benefits, pleasing both public employees and beneficiaries of other programs (whose funding would otherwise be cut). Increased benefits without additional contributions create, or augment, an unfunded liability, thereby shifting the cost of the wage increases from current taxpayers to future taxpayers. For state and local governments, the ability to create unfunded off-balance sheet obligations, such as unfunded pension liabilities, is almost as powerful as the ability to print money.

To address this problem, some states require by law that benefits cannot be increased if the action will create or increase the state's unfunded pension liability. To overcome this obstacle some lawmakers have cre-
atively recognized that even small changes in actuarial assumptions, such as an increase in projected investment returns, can create a plan surplus large enough to absorb additional benefits. Alternatively, a state legislature may choose to change or make an exception to its own law and grant state employees additional benefits despite the creation of unfunded liabilities.

These observations do not suggest that the majority of changes to actuarial methods and assumptions are politically motivated. However, a discussion of funding levels and annual contributions practices for public plans would be incomplete without addressing the political implications of different approaches.

**Actual Results Vary from Assumptions**

Even plans with stable actuarial methods and assumptions find that actual plan experience differs from projections. For example, a municipality's actual payroll growth rate will be determined by both inflation and raises for merit and seniority. Similarly, the amount of benefits that a plan must pay will be influenced by the plan's actual mortality and disability experience. Plans that have few members, are concentrated in a small geographic area, or are segregated by occupation, for example, may experience large gaps between statistically predicted outcomes and actual results.

**Benefits Reductions Legally Prohibited**

Once benefits are granted to state and local government employees, strong legal protections as well as political pressures largely preclude cuts in pension benefits. This rules out benefit cuts as a financial tool for matching assets and liabilities.

Analysis of the Government Finance Officers’ Association (GFOA) database reveals that benefit levels for 96 of the 286 plans with unfunded liabilities (33.5 percent) cannot be reduced, as mandated by state constitution, city charter, or a court order (Zorn and Eitelberg 1994; author’s computation).

These protected plans account for US $53.7 billion of unfunded liabilities, or one-third of municipal employers’ collective unfunded liability of US $162 billion. This protection is fairly strong, as changes to a state’s constitution or a city’s charter require difficult procedural maneuvers and must additionally be directly approved by a vote of the people.

A further 181 plans, or 40 percent of the total, have benefit levels protected by state statute (Zorn and Eitelberg 1994; author’s computation).
While this statutory protection is somewhat weaker, benefit decreases still require the approval of both houses of a state legislature as well as the signature of the state’s governor.

Plan Contribution Practices

Annual contributions to public plans include both “normal contributions” to meet the future liabilities of current employees and “UAAL amortization payments” to pay off the municipality’s unfunded pension liability. Total annual contributions exceed US $37 billion per year, with US $24.6 billion provided by employers and the remaining US $12.9 billion provided by employees (Zorn and Eitelberg 1994).

However, municipalities are becoming increasingly aware of the budgetary benefits of creating money by “deferring” pension plan contributions. In 1995 New York City was scheduled to contribute US $106 million per month to its plans but, according to a spokesperson, “New York City was forced by a cash shortage to defer US $212 million in [two] monthly payments to its pension funds” (Adler and Sacco 1995). Thus New York City chose to spend its revenues on higher priorities, including bond debt service, increasing its future obligations to its pension plans.

Even though plans are generally healthy now, the continued adequate funding of public plans is an important matter of public policy. Particularly in small states or political subdivisions, plans that become severely underfunded could either impose severe burdens on future taxpayers or force public retirees to accept lower benefits than they had been previously promised.

Practices for Repaying Unfunded Pension Liabilities: Level Percentage of Payroll Versus Level Annual Payments

Many municipalities with unfunded liabilities choose to fund the UAAL through a standard actuarial method, the contribution of a “level percentage of payroll” each year. For example, a city’s normal contribution may be 12 percent of its payroll, and its UAAL amortization payment may be an additional 8 percent of payroll each year. While the “level percentage of payroll” repayment method is widely practiced and is consistent with actuarially accepted standards, it causes the UAAL to increase dramatically for many years despite its claim to be an amortization method. The repayment of a UAAL in this manner requires steeply increasing annual payments. Alternatively, plans may choose to amortize unfunded liabilities using a “level annual payment” method, but this practice requires much higher annual payments in the short run.

In comparing the two approaches, it is useful to consider a conven-
tional fixed-rate mortgage for a home or business loan. Lenders generally require equal monthly payments, divided between principal and interest. In certain situations, if the amount of the loan is very large relative to the borrower's income, the lender may permit a short period of time in which interest is paid but no principal is amortized. However, it is very unusual for the lender to allow the borrower to incur additional indebtedness in order to pay the interest due on the original loan, an ignominious practice known as negative amortization.

Level Percentage of Payroll and Negative Amortization

When a municipality amortizes its unfunded liabilities through the "level percentage of payroll" method, the employer frequently fails to make large enough annual contributions even to cover the interest due on the UAAL.

For example, the State of Louisiana has a total unfunded liability of more than US $7.2 billion. The average actuarially assumed interest rate for the State of Louisiana's various plans is 8.25 percent and therefore, just to make interest payments on its UAAL each year, the state should pay US $600 million per year to its plans (Office of Legislative Auditor State of Louisiana 1993; author's computations).

In fact, in accordance with standard actuarial practice, state forecasts call for only US $400 million in annual contributions over the next few years, adding another US $200 million per year to its UAAL. Due to this logic, the state's unfunded liability is projected to grow for the next twenty years until it reaches a maximum of US $10.5 billion. At that point, it is projected that the state will rapidly amortize its UAAL with US $1.5 billion per year of amortization payments (these payments will be in addition to the normal contributions due). The state's total payments to meet interest and principal on the US $7.2 billion UAAL over the next 32 years are projected to exceed US $27 billion (Office of Legislative Auditor State of Louisiana 1993; author's computations).

Louisiana has very strong state constitutional protections precluding decreases in public employee benefits (Office of Legislative Auditor State of Louisiana 1993). Therefore, the only choice available to the taxpayers and their elected officials is between significantly increasing current UAAL payments at least to meet the current interest cost or to continue to incur negative amortization by deferring the payments into the future at an even greater cost.

Louisiana should not be uniquely criticized for these practices. Its experience is typical, as over 200 public plans have UAALs (Zorn and Eitelberg 1994), and the level percentage of payroll method is a commonly accepted practice for the amortization of unfunded liabilities.
Proponents of the level percentage of payroll method argue that if future payrolls are not as large as projected, future benefits requirements will not be as large either, and thus plans are not exposed to significant funding risks. However, use of this amortization method raises important public policy questions. Many of these implications are beyond the scope of this chapter, but one consequence—the difficulty that this practice causes when attempting to refinance the UAAL—will be addressed below in the discussion of pension funding bonds.

To summarize the liability outlook, plans are generally healthy, but defined benefit plan liabilities are difficult to predict. Reductions in benefits are often legally prohibited, and some actuarially recommended funding methods allow the UAAL to increase for decades before meaningful principal repayments are contributed. Despite the overall strength of most public plans, the dollar amount of public plan unfunded liabilities should convince state and local governments to explore mechanisms to fund their retirement plans more efficiently.

This discussion of liabilities provides important background information necessary to understand how PFBs can be used to alter current contributions practices. It is also helpful to understand how public plans invest the contributions that are made by public employers.

Public Plan Investments

In sum, public plans primarily invest in marketable securities, such as publicly traded equities and investment grade bonds. Investments may also include assets as commodities, real estate, non-investment grade bonds, but these types of investments typically account for only a small portion of a plan's asset allocation. Most public plans operate in perpetuity and attempt to meet all current obligations with current contributions and income from invested assets. Therefore, the corpus of a public plan's assets are generally invested to provide protection of principal, and a balance between capital appreciation and current income.

Investment Policy and Asset Allocation

The investment policy and asset allocation of a public pension plan is either defined by statute or determined by the retirement plan's board members. This policy may prohibit the plan from owning certain types of assets, such as foreign real estate or derivatives. As noted above, a typical public plan allocates 85 percent of assets among domestic equities and bonds. Typically, less than 10 percent of plan assets are held in so-called "risk-free" investments such as short-term United States government securities (Zorn and Eitelberg 1994). Because ERISA standards do
not apply to state and local government plans, public retirement boards retain the discretion to take a great deal of financial risk or no risk at all (except to the extent that investment policies are directed by state and/or local laws).

Public plans do change their asset allocations over time, based on both fluctuating expectations about the relative returns of different asset classes and the forecasted cash-flow needs of the individual plan. To the extent that a public plan reallocates its assets among different asset classes based on a particular forecast of equity returns or interest rates, the plan engages in market timing. While plan contributions do come in over time, such as US $25 million per month, and therefore provide plans with the opportunity to realize returns similar to “dollar cost averaging” techniques, in reality when a plan shifts its asset allocation it moves a tremendous amount of funds from one sector to another. These reallocations more than offset the long-term averaging effect that could result from consistently investing a fixed amount of money in a fixed-asset allocation. The practice of market timing is not necessarily harmful (in fact, as discussed below, public plan returns in recent years have been above expectations); however, it is important to recognize that public plans actively make decisions about movements in interest rates or equity prices and take meaningful financial risks every day with a significant amounts of funds.

**Investment Return Objectives**

The typical (median) public plan assumes that it will earn an 8.09 percent long-term rate of return on its investments. Public plans responding to the PPCC survey cited above realized an average investment return of 10.62 percent per year from 1988 through 1992 (Zorn and Eitelberg 1994).

**Why Do Public Plans Invest in Equities and Corporate Bonds Instead of Treasury Bills?**

State and local governments take financial risks, including both market risk and credit risk, by purchasing equities and corporate bonds. Plan investments also typically include long-term government bonds, such as federal agency securities, which protect the plan from credit risk but still carry interest-rate risk. Taxpayers can benefit from this investment approach because these asset classes have historically provided a greater long-term rate of return than Treasury bills, requiring less taxpayer contributions to the public plan.

It is important to recognize, however, that the vast majority of public
plan assets are invested in securities whose values fluctuate over time. Public retirement plans actively make investment decisions, involving billions of dollars each year, to choose which securities to sell, hold, or buy based on a plan's view of the relative performance of different market sectors. For example, a plan may previously have given 5 percent of its portfolio to a particular money manager focusing on overseas equities; after reevaluating its investment alternatives, the plan may choose to shift the funds to a domestic money manager focusing on "small-cap" domestic equities.

The reallocation of assets among asset classes is a well-established and widespread practice for public funds; in fact, if public funds were subject to ERISA, a diversification among asset classes and particular holdings would be required by federal law. While this practice of investing in marketable securities and making sector decisions among asset classes may appear relatively straightforward to seasoned pension money managers, public plan investment practices may be relatively unknown among the general public. In fact, as will be discussed below, one of the primary concerns raised by opponents of PFBs is that a public employer may erroneously decide that interest rates are unusually low, issue PFBs, and provide the bond proceeds to its public employee retirement plan, which then purchases investments that perform poorly.

It is helpful to put the general discussion of PFBs into context by recognizing that public retirement plans make multi-billion dollar judgment calls (more eloquently described as "investment decisions" or "asset allocations") about future interest rates and equity prices every day through their actions in purchasing securities, selling securities, or even by simply holding existing positions. There is nothing inherently wrong with public plans making judgment calls; in fact, each public plan is required by its own investment policy guidelines to make such decisions. Despite what may be conventional wisdom, public plans (and to some extent their contributing employers, who often participate in retirement board meetings) are not inexperienced in considering sophisticated issues relating to market timing and the relative performance of different asset classes.

**Legal Status of Public Plan Investment Ownership Is Risky**

One feature of public plans that not only raises concerns about whether PFB proceeds should be contributed to public plans, but more generally concerns both retirees and taxpayers, is that public plan assets remain under the ownership of the contributing employer in the event of a municipal bankruptcy.

The credit quality of the employer is important not only because the
employer is the source of future contributions but also because the employer often holds all assets purchased with past contributions. “[P]articipants in 457 (state and local) plans are particularly nervous following the Orange County, California bankruptcy. Because 457 plans ... are the property of the employer, the assets are subject to the claims of general creditors if the employers go bankrupt. In contrast, corporate retirement plans ... are required by ERISA to hold employee contributions in separate trusts” (Adler and Sacco 1995).

The use of plan assets is one of the few instances in which federal regulations govern state and local retirement plans. Prior to the Tax Reform Act of 1986, municipal employers would borrow money by issuing low-interest rate tax-exempt PFBs and invest the PFB proceeds into its public retirement fund, which invested in higher-yielding taxable securities (but was not required to pay tax on the investment returns). This approach created arbitrage gains, at the expense of the federal government, by exploiting the power Congress gave municipalities to issue tax-exempt bonds. As a result of the 1986 federal tax reform act, municipalities may not issue tax-exempt bonds to fund retirement contributions, and all contributions made to public plans are irrevocable. (Ironically, this prevented Orange County, California from using retirement fund investments to avoid bankruptcy while simultaneously jeopardizing public employee retirement funds once the County was in bankruptcy by subjecting the employee funds to the claims of general creditors.)

As a result, public employees face meaningful credit exposure to the future financial condition of their employer, both for job security and retirement security. In some jurisdictions, such as a city or a state, the government may be able to make up for poor investment returns in its retirement plan by using surplus funds, making cuts to government programs, or raising taxes to increase contributions. If a public employer declares bankruptcy, or has no taxing authority and only limited ability to increase revenues (e.g., a turnpike authority), employees may ultimately be forced to accept decreased pension benefits despite state constitutional and statutory protections. Public retirees who are citizens of the jurisdiction would be particularly impacted, as they may otherwise benefit from government programs that would be cut, would pay a share of the resulting tax increases, and would receive diminished retirement benefits. Federal government pension plan insurance does not extend to state and local government retirement plans, which are exempt from nearly all federal regulation and do not pay insurance premiums to the federal government.

In sum, state and local government plan assets are invested in securities that carry inherent credit and investment risk, state and local govern-
ment plan assets are not protected from employer bankruptcy by legal structures, and public retirees' future retirement benefits are not protected by federal pension insurance.

**Public Policy Implications of Current Public Sector Approach**

The continuing performance of public sector funds will fundamentally impact the financial position of state and local governments. Meaningful adjustments to the current approach to public pension plans may be desirable. However, based on the legal hurdles to implementing changes, such as state constitution and city charter requirements, and the author's interviews with public plan decisionmakers, fundamental changes (such as adopting a defined contribution plan) are more likely to be discussed than implemented by the nation's largest public employers. Furthermore, federal law changes, such as alterations in the legal ownership of 457 plans or the integration of state and local government plans into the federal private-employer pension plan guaranty system, appear even more remote. Therefore, in the absence of major changes, the only course of action available to state and local government employers is to make the best of the pension system they have inherited, specifically by maximizing investment returns and minimizing funding costs at acceptable levels of risk.

Tremendous attention is given to maximizing public plans' investment returns, and performance results are carefully scrutinized each quarter to assure that plan returns match or outperform relevant benchmarks such as the S&P 500 index. Because public plans choose to maintain more than 85 percent of their assets in publicly traded securities, it is reasonable to conclude that public plans are well-served by the capital markets.

Comparatively less attention has been given to the idea of using the capital markets to fund US $162 billion in unfunded liabilities more efficiently. The following sections describe pension funding bonds and the impact that the approach can have on a municipality's ongoing financial operations.

**Capital Markets Approach to Funding Liabilities: Pension Funding Bonds (PFBs)**

Funding a defined benefit pension system with invested assets is a complex and dynamic process. Issuing bonds to provide contributions in a lump sum is only one of many changes that can be made to alter the
public plans. Interest on these bonds was exempt from both federal and state personal income taxes (thus, carrying a below-market interest cost), and the investments purchased by the plans accrued tax-free until paid out as benefits. The Tax Reform Act of 1986 prohibited further issuance of federally tax-exempt bonds to fund public retirement plans, which eliminated the municipalities' risk-free tax arbitrage (although individual states may continue to exempt interest on PFBs from state taxes). After 1986, municipalities could only issue pension bonds at interest rates comparable to corporate bond interest rates, which were generally higher than the plans' projected rates of return. Therefore, given the changes in tax laws and proportionately high interest rates relative to plans' expected rates of return, PFBs faded into obscurity.

In 1993, however, long-term bond interest rates declined to their lowest levels in more than twenty years. Municipalities believed that it was cost-effective to issue PFBs to repay their UAAL in full, as the PFB borrowing cost declined below the plans' expected rates of return. By the end of 1994, California cities and counties had issued more than US $4 billion of PFBs. These California municipalities were able to access the markets quickly because the legal authority to issue PFBs, which derives from the powers provided to a municipality by each state's constitution, legislation, and court rulings, was already in place in California.

Prerequisites for Implementing PFBs

Pension funding bonds share many common characteristics with other types of publicly issued municipal securities. Investors demand that any municipal security, including PFBs, must be legally authorized by the municipality, debt service must be supported by a sufficient stream of municipal revenues, and bondholders must be entitled to reasonable protections.

Legal Authority

A municipality can derive the legal authority to issue PFBs in two ways. First, it may determine that existing state law permits the issuance and repayment of PFBs. To make this determination, the municipality may rely on the advice of a prominent law firm familiar with state law. However, to be confident that this new approach is unquestionably authorized under existing law, several PFB issuers have taken the additional step of validating the legal theory by challenging themselves in court. Specifically, California municipalities, including the city of Fresno and the counties of Alameda, Los Angeles, and Sonoma, have obtained rul-
ings from the California Superior Court that pension bonds are legal, valid, and binding obligations of these jurisdictions, consistent with state laws and rulings dating from 1937 to the present. Second, legislation can be enacted, typically by the state legislature, that specifically authorizes the state and/or its political subdivisions to issue PFBs, proscribes the manner and method for issuing such bonds, and delineates the various sources of government revenues that can be pledged to the repayment of the principal and interest due to bondholders.

Regardless whether PFBs are authorized by either existing or newly enacted legislation, many state and local jurisdictions have legal requirements that a majority of voters must directly approve any new debt obligation. However, these legal requirements typically exempt the refinancing of an existing obligation from reauthorization. The California cities and counties mentioned above have successfully validated in California Superior Court that municipalities are legally bound to pay unfunded pension obligations. Therefore, because pension bonds refinance existing obligations, in some states PFBs do not need to be reauthorized by direct vote. This line of reasoning is commonly employed by municipalities to refinance an existing bond issue, to raise funds to comply with a court ruling such as school integration, or to satisfy a monetary judgment levied against the municipality.

In addition to obtaining the authority to issue debt and to use governmental revenues to repay the bonds, the municipality must specifically choose the revenue source it will pledge to bondholders to repay the principal and interest due on the PFBs.

Sources of Repayment

Municipal governments can issue different types of securities that carry different debt ratings, just as corporations can issue different classes of senior and subordinated debt. Four types of repayment mechanisms will be discussed here. First, the "general obligation pledge," which carries the full faith and credit of the municipality, is the strongest type of security. This pledge would require the government to increase taxes until sufficient revenues are generated to repay the full amount of debt service due each year on the bonds.

Alternatively, the municipality may provide a "general fund pledge" by agreeing that it will budget and appropriate funds each year to repay the bonds, but only to the extent that money is available to pay debt service. This general fund pledge carries a slightly weaker credit rating than a general obligation pledge and therefore carries a slightly higher interest cost, but is still widely accepted by investors as a creditworthy
A general fund pledge to only pay debt service if revenue is available in a given year closely parallels the current arrangement for repaying the UAAL, providing credibility to the argument that the PFBs are merely a refinancing of an existing obligation. Most California PFBs carry a general fund pledge.

Third, the PFB issuer may pledge a specific source of revenue to the repayment of the bonds, such as funds generated by a gasoline tax or a sales tax. This type of security can either be stronger or weaker than a general fund pledge, depending on economic conditions affecting the volume of sales being taxed. This type of pledge often requires voter approval.

Finally, to the extent that state law permits, cities and other political subdivisions may provide bondholders with a “state aid intercept mechanism” whereby the jurisdiction assigns its rights to receive state aid (such as a share of state motor vehicle licensing fees) to the PFB investors through a bond trustee. The bond trustee will directly receive the municipality’s share of state funds, which are used to pay bond debt service, and only the remaining funds are passed through to the municipality that issued the PFBs. The municipality may also make additional payments if the state intercept money is not sufficient to repay the bonds fully.

A municipality may combine several of the above revenue sources to provide a particularly strong security, or it may create an entirely different type of security. These four security structures are only a few permutations of “pension funding bonds.” In practice, nearly any debt incurred when pension fund contributions are modified can be construed as PFBs.

**Debt Ratings**

Consistent with the judicial rulings discussed above, Moody’s Investor Service and Standard & Poor’s Corporation have taken the view that pension bonds simply refinance a municipality’s existing obligation to repay its UAAL. A recent Standard & Poor’s rating analysis observed that the PFB being reviewed “shifts a portion of an off-balance sheet UAAL to on-balance sheet” (S&P 1995:30).

To the extent that pension bonds are used only to fund unfunded liabilities, this analysis may be reasonable. However, because there is no standard accepted definition of a PFB, it is possible to issue pension bonds not only to refinance a UAAL amortization schedule but also to borrow funds to make the current fiscal year’s normal contribution. Depending on the municipality’s overall debt burden and alternative borrowing costs, this approach may be prudent, but it may also serve as a
mechanism for generating one-time budgetary relief that is similar to a decision to skip an annual normal contribution. Any irresponsible use of debt could cause a municipality’s debt ratings to be lowered, not only for the PFB bond issue but for all other outstanding debt issues. The strength of a municipality’s credit ratings will strongly influence its ability to earn a positive net rate of return by issuing PFBs. The interest rate for a pension bond issue will be determined by investor perception of the municipality’s credit risk relative to other bonds available in the market.

Municipalities with weak credit ratings may prefer to continue to amortize the UAAL at the actuarially assumed interest rate. Under the current arrangement, a poorly rated government’s employees take material credit risk by maintaining a UAAL as a plan asset. Bondholders will not welcome the opportunity to step into the plan’s shoes as creditors of a poorly rated municipality, and PFB interest rates may be higher than the plan’s projected rate of return. On the other hand, municipalities that enjoy strong credit ratings, consistently make retirement plan contributions, and maintain sound actuarial and accounting practices may find it cost-effective to issue PFBs.

Under the assumption that the PFBs are well structured, the investment of the proceeds by the public plan is also an important ratings factor. The rating agencies are not troubled by public plan investments that are consistent with commonly accepted investment practice. Equities and bonds are acceptable, but exotic derivatives raise questions. For example, Moody’s determined that “the asset allocation plan” of Alameda County, California “is viewed as prudent, with investments distributed 40 percent in equities, 37 percent in fixed-income, 12 percent in real estate, 10 percent in international, and 1 percent in cash” (Schaffer et al. 1995). Whether the rating agencies should be more concerned about the market and credit risk of these investments is subject to further debate.

**Impacts of PFB Approach on Public Employers and Public Plan Beneficiaries**

A PFB issue alters the municipal employer’s UAAL amortization payments to its retirement plans, changing the status quo funding cost, investment risk, financial flexibility, and long-term funding progress of the municipality and its employee retirement plan.

To the extent that municipalities maintain a defined benefit plan and invest capital in risky assets to fund such plans, municipalities perform the role of an investment company. The basic purposes of an investment company are first, to borrow at the lowest possible cost and second, to invest the borrowed funds at the highest rates of return that can be ob-
tained at acceptable levels of risk. In concept, PFBs allow municipalities borrow funds against their excellent ratings at a low cost, enabling public retirement plans to invest in capital markets assets such as equities and corporate bonds. It is helpful to note that, in the absence of a PFB issue, the municipal employer would continue to make annual UAAL amortization payments into its plan, and the plan would invest these funds in equities and corporate bonds.

**Funding Cost**

Municipalities with high-quality debt ratings (at least "A" from Moody’s and/or Standard & Poor’s) have been able to access the credit markets at interest rates ranging from 25 basis points more than Treasury securities in the shorter maturity ranges to interest rates of approximately 90 basis points more than Treasury securities for longer-term (such as thirty-year) maturities. These relationships fluctuate constantly under changing market conditions.

By issuing serial bonds that have principal maturing each year rather than a single long-term maturity, PFB issuers are able to benefit from the slope of the yield curve, or the difference between short-term and long-term interest rates. The County of Sonoma, California and the City of Fresno, California issued PFBs at an overall interest cost of approximately 6.75 percent and 7.50 percent, respectively. To date, both the Sonoma and Fresno plans have earned double-digit rates of return on the PFB proceeds, and both plans continue to project long-term rates of return in excess of their employers’ respective borrowing costs.

The most significant risk in locking in the funding cost is that the plans’ actual returns will fluctuate over time. If the long-term return on plan investments is equal to the employer’s borrowing cost, the employer will break even relative to its borrowing cost. If the average return exceeds projections, the municipality will realize increased savings from the PFB issue (although the employer is forbidden by federal law from removing excess funds from the plan, the employer may choose to eliminate normal contributions temporarily when the plan is projected to be overfunded). If the average return declines below the PFB borrowing cost, the municipality’s borrowing rate will exceed its investment return, causing a net loss and necessitating additional unfunded liability payments from the employer.

Two other potential risks that must be considered are the additional investment risk that may be created by a lump-sum deposit of bond proceeds, and the excessive optimism required in a public plan’s rate of return forecast if it believes that it can earn a higher long-term return than the employer’s PFB borrowing cost.
Investment Risk

First, a plan receiving a lump-sum payment may invest the funds at a particularly poor time in the market cycle. For example, a municipality with a US $2 billion UAAL might issue US $two billion of PFBs, as the County of Los Angeles did in 1994. This lump sum was deposited to the public plan all at once, as opposed to a series of relatively smaller contributions over many years.

One issue is whether the lump sum would be invested in the same types of securities that would have been purchased with annual amortization payments. Because all funds deposited, whether from normal contributions, UAAL amortization payments, or PFB proceeds, are invested in equities and bonds, it is unlikely that a lump-sum deposit would be invested any differently than annual payments, particularly if the public fund passively indexes its investments. PFBs do not appear to increase the types of risks assumed by public plans. A second consideration is whether a large investment by any one public plan will materially affect market prices. Assuming that the plan maintains a fairly typical asset allocation or indexes its investments within each asset class, market prices for equities and bonds purchased by the plan should remain relatively unaffected.

Therefore, if PFB proceeds do not change the types of assets purchased, and the size of the purchase does not independently increase the cost of the assets purchased, the remaining question is whether the plan assumes a large incremental risk by investing the PFB proceeds at any one point in time. Under the status quo, the employer typically makes bimonthly UAAL amortization payments to the plan, thus providing the plan with a fairly consistent stream of revenue to invest each month. Therefore, investing the present value of the future UAAL payments at one point in time could cause the plan to experience higher or lower returns over the long run than if the funds were invested over time. It is difficult to evaluate whether a plan would be better off or worse off by changing its investment of the UAAL amortization payments. Theoretically, there is no way to predict which method will yield better future returns.

What may be helpful is to compare the PFB lump-sum investment activity in the context of the plan's other investment activities. Public plans regularly reallocate funds among asset classes, based either on judgments about future market conditions or to match investment income more closely with their projected cash-flow needs. Therefore, a plan's ongoing investing activities emulate lump-sum investments. For example, a public plan may have US $100 billion of plan assets, of which it may choose to increase its asset allocation in equities by 5 percent and decrease its asset allocation in bonds by 5 percent. Even such a modest
reallocation will involve the sale of US $5 billion of bonds and the purchase of US $5 billion of equities, presumably over as relatively short a time horizon as a three-month period. Unless the PFB proceeds provide a substantially large increase in plan assets, the risk associated with the lump-sum investment of the PFB deposit will closely resemble the risks that the plan regularly takes when reallocating its assets.

Therefore, the incremental risk introduced by the lump-sum investment of the PFB proceeds may be material and should not be underestimated, but any determination of the acceptability of this risk must be placed within the context of a plan’s ongoing risk-taking activities.

Projected Rates of Return

When a retirement plan believes it can reinvest bond proceeds at a higher rate of return than the employer’s borrowing cost, it is logical to ask whether the plan’s projected rate of return (also referred to as actuarially assumed interest rate) is realistic.

There are three factors that may help a plan may to consider why its rate of return is projected to be higher than the PFB borrowing cost. First, the general level of market interest rates may have declined rapidly over a recent period of time, and the plan’s forecasts do not adequately reflect changing market rates of return. A decline in interest rates would enable the employer to issue relatively low-cost PFBs, for example, at an interest rate of 6.75 percent, while a plan’s projected long-term rate of return may remain unchanged at 8.09 percent. If the plan’s return on future investments is closely correlated to the future level of interest rates, declines in market interest rates may be a signal that the plan’s projected long-term rate of return should be lowered.

However, a plan may believe that interest rates have declined only temporarily and, while the employer will benefit from borrowing at low rates, the plan will invest its assets gradually over a 12-month period to capture increases in interest rates. Acting on the belief that interest rates are only temporarily lower may appear to be a bold market call, particularly for a public plan, but as discussed above a US $100 billion public plan with 40 percent of its assets in bonds is already taking a meaningful position on the future level of interest rates.

Another possible reason that the plan may not need to reduce its expected rate of return after a sharp decline in interest rates is that retirement plans’ actual returns of 10.62 percent between 1988 and 1992 have exceeded the plans’ projected rates of return of 8.09 percent (Zorn and Eitelberg 1994). Thus, plans may already believe there is a sufficient margin for error embedded in their projected returns.

When comparing a plan’s projected investment returns with a public
employer's borrowing cost, a second factor to consider is the difference in credit quality between the public employer's bond issuer rating and the average rating of securities in which the plan is invested. If the employer carries a "AA+" rating from Standard & Poor's, for example, and the plan invests in securities with an average credit rating of "A," then the employer's borrowing cost should be lower than the plan's returns.

Some may argue that a public employer may be leveraging its excellent credit rating to fund the plan, but recall that the employer is already obligated to make the annual UAAL amortization payments if it does not issue the PFB, and the rating agency's assessment of the employer has already included the projected UAAL amortization payments. Furthermore, the plan is already investing in securities of a certain credit quality, independent of the employer's decision to issue PFBs, and under either the status quo or PFB alternatives, the employer remains obligated to pay any unfunded liability of the plan.

Beyond considerations of whether a plan's currently projected rate of return has an adequate margin for error, or whether net returns are generated by differences in credit ratings, a third factor to consider is whether a plan's overall investment returns can remain high even when bond yields decline. Assuming that a recent drop in bond yields is permanent and not a temporary opportunity to borrow at unusually low interest rates, a plan's asset allocation may still enable it to generate higher rates of return than the employer's borrowing cost.

For example, if the plan invests 60 percent of its assets in equities and 40 percent in corporate bonds, the plan could earn a high total rate of return on its equity investments, such as 9 percent, even though it may only break even on the corporate bond portion of its portfolio, which could yield a return equivalent to the employer's borrowing cost, such as 7.5 percent. Even for the bond portion of its portfolio, the municipal employer still enjoys the benefit of a small tax arbitrage because interest on the municipality's bonds are exempt from state taxes and therefore carry yields slightly below comparably rated corporate bonds.

A municipal employer considering the issuance of PFBs should very carefully consider these issues relating to its retirement plan's projected rates of return. If the plan should fail to earn a rate of return equal to its projected rate of return, the plan will have an additional unfunded liability and the employer will be obligated to make additional future UAAL payments to the plan.

**Financial Impact: Precludes Ability to Skip Payments**

Employers that have unfunded liabilities enjoy certain repayment provisions unavailable to other debtors, such as the ability to skip a payment
at will or to extend the final maturity of the obligation each year. However, when plan returns exceed borrowing costs, this flexibility comes at a price.

Some municipalities may not value the flexibility to skip UAAL amortization payments, being satisfied that the ability to skip a future normal contribution preserves sufficient financial flexibility. Other municipalities may want to retain the ability to skip both normal and UAAL amortization contributions. In the latter case, taxpayers or public employees may benefit from the discipline imposed by the externalization of the debt (if they believe that the employer would not default on its debt service obligations to PFB investors).

If legislation is necessary to implement the PFB, policymakers may choose to mandate that no additional unfunded liabilities may be intentionally created. This may be helpful not only to ensure that the municipality does not skip future normal contribution payments but also that public employees—seeing that the plan is fully funded—do not create pressure to create new unfunded liabilities by increasing benefits.

**Financial Impact: Additional Unfunded Liabilities Still Possible**

Additional unfunded liabilities may still arise unintentionally. Due to the defined benefit nature of the employer's obligation, it is difficult to predict a plan's actual liabilities. It is possible that in a given year a municipality would have to pay both PFB debt service and the amortization of a newly created UAAL. A political risk created by PFBs is that voters may be unwilling to begin amortizing a new UAAL within a few years after bonds were issued fully to extinguish the formerly projected UAAL.

**Financial Impact: Possible to Overfund Plan**

Actuaries have raised the concern that under some circumstances a PFB issue could result in the "terminal overfunding" of a plan. This would occur if a plan reached a high enough surplus that its investments were projected to generate enough income each year to pay all plan benefits, even without any annual normal contributions from the employer. (Once PFB proceeds are deposited to the plan, the funds cannot be withdrawn by the employer.)

For open (ongoing) public plans, employment will typically increase over time and benefits will continue to be increased, both of which would decrease the plan's surplus if additional normal contributions were not made. Despite the permanence implied in the diagnosis, "terminal overfunding" for open plans is only a temporary condition, and one that would be welcomed by most public plans.
The terminal overfunding concern is relevant, however, for closed plans, which do not accept new members. A closed fund facing terminal overfunding could invest a substantial proportion of its assets in Treasury bills, lowering the expected surplus (due to a lower rate of return on Treasury bills than the projected return of a diversified portfolio) but protecting the plan from any investment performance risks. Furthermore, plan benefits could be increased to draw down the plan's assets faster than original projections. Employers funding a closed plan's UAAL with PFBs should be particularly cautious, as there are far fewer mechanisms available to adjust the plan's ongoing cash flows over time.

Financial Impact: PFBs Do Not Allow Negative Amortization

If plans are currently making actual funding progress, contributing funds each year to pay the full amount of interest due on the UAAL plus a portion of the principal amount of the UAAL, it is possible under certain market conditions to structure pension funding bonds that will provide a financial gain to the employer. However, as discussed above, some municipalities have severe negative amortization, and even a PFB issued as a single, long-term maturity would require the municipality to make interest payments which may exceed the current UAAL amortization payments. Investors are accustomed to receiving interest and principal payments each year, and converting a level percentage of payroll payment to a flat-level dollar payment may require cash flow changes.

Gary Finley, the Executive Director of the Missouri State Employees Retirement System and a skeptic of PFB issuance, has analyzed the mismatch between amortization patterns, concluding that special structuring techniques are often needed to avoid this dilemma (Finley 1994). One structuring alternative available is the issuance of discount (zero-coupon) PFBs that do not pay interest until maturity. However, PFB investors have not widely accepted such a structure at a cost-effective interest rate. Municipalities with severe negative UAAL amortization patterns have the most to gain over the long term by increasing their annual payments to amortize the UAAL, as interest on interest is avoided in the later years—potentially saving billions of dollars for some state governments.

Leaving aside a retirement plan's potential to earn a higher rate of return than the employer's borrowing cost, a primary benefit of issuing PFBs is that the employer may not have the discipline to make the annual UAAL amortization payments, which is how the negative amortization pattern may have been established. Similarly, a current state legislature that has begun to make progress on the UAAL amortization may not feel confident that a future legislature will continue these efforts. In either
circumstance, a PFB issue can impose much-needed discipline into the funding process. An employer that has adequate financial discipline, and does not believe that it would benefit from the potential difference between its borrowing cost and its retirement plan's investment returns, would be well-advised simply to increase its own annual UAAL amortization payments without issuing a PFB. The self-disciplined approach would enable the employer to save the administrative costs associated with PFB issuance.

To summarize the financial impact of pension funding bonds, it may be possible for public employee retirement plans to earn long-term rates of return that exceed employers' PFB borrowing costs, but it is also possible that projected rate of return may be overestimated. Government employers that need the added financial discipline imposed by annual debt service payments, or are concerned about the discipline of future elected officials, may welcome PFBs as a mechanism for increasing UAAL amortization payments. However, this may prove difficult for municipal employers with severe negative amortization patterns, who would have to increase their annual payments to refinance their UAAL with pension funding bonds. Furthermore, employers that have the self-discipline to increase their contributions without the added obligation imposed by the capital markets can save administrative costs by increasing their contributions of their own volition.

Gary Finley summarizes three of the most important financial concerns relating to pension funding bonds. First, public officials may misunderstand that funding the UAAL does not extinguish the employer's ongoing obligation to meet all defined benefits. Second, employees may view the municipality's cost savings as an opportunity to increase benefits. Third, employers must consider whether an internal restructuring of contributions to the plan could accomplish similar results (Finley 1994).

**Conclusion**

Public plans maintain over US $1 trillion in assets and are responsible for the well-being of more than 13,000,000 public servants. Municipalities would be well served to investigate the nature of the risks that taxpayers assume as the providers of a defined benefit plan with uncertain liabilities and as the effective guarantors of public plans' inherently risky debt and equity investments.

Given the assumption that the defined benefit nature of plan liabilities will remain unchanged and that public plans will continue to invest in equities and bonds, this chapter has explored pension funding bonds as a technique for efficiently funding employer liabilities.
PCBs offer the potential to fund liabilities at a lower interest cost than the public retirement plans' projected investment return. Furthermore, the funding discipline introduced by the obligation to pay an external debt may benefit both taxpayers and employees. However, this discipline is imposed through a reduction in financial flexibility.

It is important to recognize that the repayment of a currently projected unfunded liability does not prevent future unfunded liabilities from being created, either due to increased benefits or due to unexpected changes in assets and liabilities. Municipalities with severely unfunded liabilities, particularly those that presently incur negative amortization, have the most to gain from the discipline imposed by PFBs but also would experience difficult short-term financial adjustments. Municipalities with high-quality ratings (at least “A” by Moody’s and Standard & Poor’s) are most likely to issue PFBs and can successfully use the technique under certain market conditions to provide increased retirement security to public employees at a lower cost to taxpayers.

Pension bonds attempt to reconfigure complex flows of funds, taking into consideration dynamic effects that occur over time. The complexity of the predicted interactions among benefits due and plan assets are compounded for multiemployer retirement plans, such as statewide teachers’ retirement systems.

This chapter has attempted to provide an introductory discussion of issues relating to the concept of pension funding bonds issued by state and local government employers, and the potential costs and benefits of the approach. A maxim familiar to students of American government is that “all politics is local.” Similarly, the determination of whether pension funding bonds are suitable for a particular municipal employer and its public employee retirement plan is best evaluated on a case-by-case basis.

References


Standard and Poor's (S&P). *Standard & Poor's Creditweek Municipal* 15, 3 (April), 30.
