

# Discounting State and Local Pension Liabilities

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# Discounting State and Local Pension Liabilities

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Defined benefit (DB) pension plans continue to dominate the retirement landscape for the roughly 20 million state and local government workers in the United States. In most state and local plans, pension benefits are protected by constitutional, statutory, or common law guarantees. In many cases, these guarantees make the benefit promises to participants virtually free of risk. Finance theory is unambiguous that the discount rate used to value future pension obligations should reflect the riskiness of the liabilities.

In actual practice, state and local plans generally set their discount rates based on the characteristics of the assets held in the pension trust rather than the characteristics of the pension liabilities. Specifically, these plans generally discount their pension liabilities using the assumed rate of return that the assets in the pension trust are expected to earn.<sup>2</sup> This practice has several implications. First, the use of higher-than-appropriate discount rates reduces the value of the pension obligations that is reported to the public, and thus likely reduces the contributions that sponsors feel they must make to pre-fund their pension obligations. Second, the link between the discount rate and the expected return on plan assets may encourage sponsors to invest in riskier portfolios than they would otherwise choose in order to justify a higher discount rate, and thus a lower contribution into the pension trust. Third, these rules may encourage fiscal gaming in the form of "Pension Obligation Bonds." These devices allow governments to borrow, invest in risky assets through the pension trust, and treat the difference between the expected asset return and the bond interest rate as "found money."

In this paper, we describe the prevailing practice among state and local pension plans with respect to discounting their liabilities. We then describe the actual risk characteristics of state and local pension liabilities, and highlight the role of the various legal protections such benefits are afforded. We then briefly sketch the normative theory of how pension obligations should be discounted. Finally, we discuss the pros and cons of various real-world proxies for the theoretically appropriate set of discount rates for low-risk cash flows.

## I. What Do State and Local Governments Actually Do?

State and local governments typically discount their future pension obligations using a methodology laid out by the Government Accounting Standards Board (GASB), an independent organization that establishes standards of accounting and financial reporting for state and local governments. GASB provides its recommendations in its Statement 25, "Financial Reporting for Defined Benefit Pension Plans and Note Disclosure for Defined Contribution Plans." GASB 25 states that the discount rate "should be based on an estimated long-term investment yield for the plan, with consideration given to the nature and mix of current and expected plan investments...." In a related context, Wilcox (2006) notes that the link between discount rates and investment returns is "remarkable...because it suggests that plan sponsors can reduce their funding obligations by investing in riskier securities, whereas conventional finance theory would suggest that a given level of benefit security can be maintained despite a shift to a riskier investment portfolio only by increasing, rather than reducing, contributions into the plan."

Empirically, state and local governments follow the GASB standards. Robert Novy-Marx and Joshua D. Rauh (2008) examine the Comprehensive Annual Financial Report (CAFR) for 108 of the 112 state pension plans that had assets of at least \$1 billion in 2005. They find that the discount rates used by

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<sup>2</sup> Jeremy Gold and Gordon Latter (forthcoming) discuss many of the differences in how actuaries and economists approach the calculation of pension liabilities.

these plans averaged 7.97 percent with a standard deviation of only 0.4 percentage point. The median and modal assumption was 8 percent. By contrast, the yield on ten-year Treasury notes averaged about 4.3 percent in 2005, while the ten-year swap rate averaged about 4.7 percent. Implicitly, state and local governments are treating their pension liabilities as having the same risk profile as the assets in which they are investing. This raises an obvious question:

## II. How Risky Are State and Local Pension Obligations?

In a majority of states, public-sector pension obligations are protected by state constitutional provisions.<sup>3</sup> In eight states, these constitutional protections take the form of explicit benefit guarantees. For example, in the Illinois state constitution, Article XIII, Section 5, provides that “membership in any pension or retirement system of the State, any unit of local government or school district, or any agency or instrumentality thereof, shall be an enforceable contractual relationship, the benefits of which shall not be diminished or impaired.” The constitutions of Alaska, Arizona, Hawaii, Louisiana, Michigan, and New York share similar “diminished or impaired” language. The New Mexico state constitution protects pension benefits with the statement that “upon meeting the minimum service requirements...a member of a plan shall acquire a vested property right with due process protections under the applicable provisions of the New Mexico and the United States constitutions”(Article XX).

Even state constitutions that do not explicitly guarantee the pension benefits of state and local workers generally do include language protecting contracts. For example, Article I, Section 22, of the Alabama state constitution provides that “no ex post facto law, nor any law, impairing the obligations of contracts...shall be passed by the legislature.” The extent of protection afforded by these contract provisions varies across states, and has been delineated over time through a series of court cases. For example, in Alabama, the court ruled in *Snow v. Abernathy* that the retirement system was indeed contractual in nature, and that a participant’s “rights vested thereby...cannot be abrogated by legislation....”

One dimension along which these protections differ across states is the point at which the pension benefit is deemed to become a contractual agreement. Some states, such as Montana, deem the pension promise to have become a contractual agreement when the employee was hired. In *State ex rel. Sullivan v. Teachers’ Retirement Board*, the court ruled that “the terms of the teachers’ retirement benefit contract in Montana are determined by the controlling provisions of the teachers’ retirement system statute in effect at the time the teacher becomes a member of the Montana Teachers’ Retirement System. These sections of the statute become part of the teacher’s contract.” Other states have interpreted the contractual relationship as taking effect only when benefits are vested. For example, in *Petras v. State Board of Pension Trustees*, the Delaware Supreme Court concluded that “no contract exists between an employee and the State, concerning the state pension plan, unless and until the pension vests,” which in the case in dispute was not until employees had attained 30 years of service (or 15 years of service and 60 years of age). Some state protections are even weaker. In Indiana, the Indiana Court of Appeals stated (in *Haverstock v. State Public Employees Retirement Fund*) that “pensions are mere gratuities springing from the appreciation and graciousness of the state. Under such a plan, the employee has no vested contract rights until he fulfills all conditions existing at the time of his application for benefits.” By our count, however, a clear majority of states offer a constitutional pension guarantee, a strong interpretation of the contract clause that protects participant pensions starting at employment or upon vesting, or both.

Perhaps the most reliable evidence on the riskiness of public pension benefits comes from instances when a public pension plan sponsor suffers from severe financial distress. For example, during the 1970s, the fiscal position of New York City deteriorated so greatly that, by March 1975, it was unable to complete a \$912 million offering of short-term notes (Attiat F. Ott and Jang H. Yoo 1975). In response to the ensuing crisis, the city negotiated a one-year wage deferral and, over the period to 1978, cut 61,000 jobs from its payrolls, among other steps (David Lewin 1977). City

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<sup>3</sup> This section draws upon two excellent references on legal protections, Cynthia Moore (2000) and Morrison and Foerster, LLP (2007).

pension funds became important sources of financing for the city. Nonetheless, the city never reneged on accrued benefits under any of its five DB plans. This protection of pensioners during a period of losses for other parties reflected the non-impairment provision in the state constitution.

Another notorious case study occurred in the early 1990s, when Orange County Treasurer Robert Citron invested heavily in derivatives and long-term bonds, betting that short-term interest rates would remain low. In December 1994, Orange County filed the largest municipal bankruptcy in US history, following nearly \$1.7 billion in losses sustained in Citron's fund. In response, the county chief executive officer proposed a 40 percent reduction in the county's general fund budget, layoffs of more than 1,000 people, and the elimination of more than 500 other vacant positions (Matt Lait 1995). In spite of these financial difficulties, however, defined-benefit obligations were met in full. In part, beneficiaries were protected by the fact that the pension fund was overfunded. However, they were also protected by a constitutional provision stating that "the assets of a public pension...system are trust funds and shall be held for the exclusive purposes of providing benefits to participants in the pension or retirement system..." (Article XVI §17(a)). Attempts by the county to use the surplus assets in the trust fund were rebuffed.

GASB notes that "as a result of a combination of factors, including the power to tax, the nature of the services provided, and a lack of market competition, governments rarely liquidate...because governments have the power to tax...they have the ability to continue operating in perpetuity" (GASB 2008). According to GASB, the permanence of governments justifies their taking a "long-term view applied in governmental financial reporting." GASB interprets a "long-term view" as consistent with using a discount rate derived from risky assets to discount pension benefits, presumably on the notion that if the plan sponsor is guaranteed to survive the ups and downs of the business cycle and the stock market, then betting on average returns is good enough. This idea is foreign to most economists who have studied the issue.

### III. What *Should* State and Local Governments Do?

The funding status of a pension plan is determined by comparing the value of its assets to the value of its liabilities. While the standards for how this comparison is to be performed in practice are complex, the economics of how it should be done are simple. From an economic perspective, measuring the present value of the assets is straightforward, at least insofar as the assets involved are publicly traded and thus have prices that can be observed on a regular and timely basis. Measuring the present value of the liabilities is more challenging because pension liabilities do not trade in financial markets. As a result, one must estimate, rather than observe, the present value of the future benefits promised by a pension plan. Still, the steps are clear. First, one must identify the measure of liability that sponsors should attempt to value; this step is important because the characteristics of the object being discounted determine the appropriate discount rates. Second, one must identify the best real-world analogue to the ideal rates.

What measure of liability should sponsors be required to report and fund against? We favor a measure known as the accumulated benefit obligation, or ABO; the ABO measures the benefits that current employees have earned based on current salary and years of service. One reason for favoring the ABO is that it is the one measure of liability that puts pension benefits and salaries on the same footing.<sup>4</sup> In financial reports, employers are required to disclose the aggregate salaries their employees have earned by the close of the reporting period; they are not required to recognize salaries that will be earned in future periods even though today's workers may have a high probability of remaining in their jobs after the current reporting period is over. Similarly, the ABO measures the pension benefits that employees have earned by the close of the reporting period; in line with the standard convention for salaries, it does not recognize benefits that will be earned in future periods.

Some economists favor the use of more expansive measures of liability (see Deborah Lucas and Stephen Zeldes (2006) for a discussion of other measures). While such differences of view cannot be overlooked, it would be easy to lose sight of the common ground. The more expansive measures of liability encompass the ABO but add something more to it. We are not aware of a compelling reason that

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<sup>4</sup> Jeremy Bulow (1982) provides additional arguments in favor of the ABO concept.

the ABO component should be discounted differently than we recommend, even if the ABO is not the whole story.

Having identified the measure of liability that is to be discounted, the next step is to identify the characteristics of the cash flows associated with that measure of liability. Although the cash flows associated with the ABO depend on current years of service and current salary, they are still uncertain for two main reasons. First, the mortality experience of the group of employees cannot be known in advance with point precision. For purposes of identifying the theoretically appropriate discount rate, this demographic risk can be ignored provided mortality outcomes are uncorrelated with the business cycle and other factors that influence financial rates of return.<sup>5</sup> Introspection suggests that any correlation between the business cycle and the mortality experience of beneficiaries under the plan is likely to be small relative to other sources of uncertainty for the plan. On this logic, we ignore demographic risk and other similar complications.<sup>6</sup>

Second, while the benefit that can be drawn at the full retirement age is known in nominal terms given current years of service, salary, and a mortality table, some public plans offer benefits that are at least partially adjusted for changes in the price level after retirement (Jun Peng 2008, 42). In these cases, the appropriate computation of the present value of benefits involves a two-step process: discount projected benefits back to the date of retirement using rates tailored to the plan in question; then discount the resulting future values back to the present using a term structure of nominal interest rates. All discount rates should be derived from securities that have as little risk as the liabilities themselves.

Other characteristics of the discount rates also need to be specified. For example, because pension funds are tax-advantaged entities, the ideal set of discount rates would be derived from fully taxable securities. Also, most trust fund liabilities are longer term and do not impose high liquidity needs. Thus, the discount rate need not reflect the high degree of liquidity of Treasury markets, for example. Therefore, the ideal set of discount rates would be derived from securities that do not trade in an extremely liquid market. A related point is that state and local pension obligations do not become intrinsically more highly prized in the financial marketplace in times of financial stress. Therefore, the ideal set of discount rates would be derived from securities that likewise do not become more highly prized in the financial marketplace in times of market stress. In sum, the ideal set of discount rates would be derived from securities that deliver fully taxable cash flows; that deliver those cash flows with a very high degree of assurance; that trade in markets without extraordinary liquidity characteristics; and that are and free of flight-to-quality effects.

Unfortunately, every available proxy has shortcomings relative to the theoretically ideal set of discount rates. For the inflation-indexed rates, Treasury inflation-protected securities (TIPS) are the only appropriate securities available. The Federal Reserve provides daily estimates of the TIPS yield curve, including forward rates. For nominal rates, one possibility is to use rates derived from the market for nominal Treasury securities. This would have the advantages of providing discount rates that presumably are free of any premium for credit risk and that are derived from close cousins to the securities used to derive the real discount factors. One disadvantage of nominal Treasuries, however, is that they are exempt from state and local taxation, and therefore are less suitable for tax-exempt entities such as pension funds. Another disadvantage is that, in times of market stress, they become preferred havens for risk-averse investors. During such times of “flight to quality,” Treasury yields are driven down in reflection of the heightened willingness of investors to pay for liquidity and safety.

An alternative possibility would be to use discount rates derived from the market for interest-rate swap contracts. These contracts have the favorable attributes of being fully taxable, having no special clienteles, and having little (though probably not zero) credit risk. On the other hand, even this market—more robust than most—has been subject to some stress during the current financial crisis. As a

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<sup>5</sup> Technically, we treat this form of uncertainty as “unpriced” by financial markets—essentially, as idiosyncratic variation that can be diversified away.

<sup>6</sup> Other complications that arise in the context of real-world plans include early-retirement options that create uncertainty about the timing and value of cash flow.

result, the rates in this market have been driven up by investor concerns pertaining to the financial situation.

One way to balance these concerns—Treasury rates being driven down by crisis-related concerns and swap rates driven up—would be to adjust the Treasury rates for the exemption from state and local taxation, and then to average the resulting proxy for fully taxable Treasury discount rates with the swap-derived discount rates. In principle, this might provide a rough approximation for rates that are not affected by concerns related to financial crises. Another approach would be to adjust the swap rates downward in recognition of the premium they embed for credit risk, and then to live with the distortions related to financial stress.

#### IV. Conclusions

Nearly all state and local pension defined benefit pension plans compute the present value of their future liabilities using the expected return on the assets held in the pension trust. This practice contrasts sharply with finance theory, which is unambiguous that the appropriate discount rate is one that reflects the riskiness of the liabilities, not the assets. This paper notes that the strong constitutional and other legal benefit protections make many defined benefit pension obligations virtually risk free. Were governments to discount liabilities in this way, it would reveal that state and local pensions are more underfunded than is generally reported.

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