

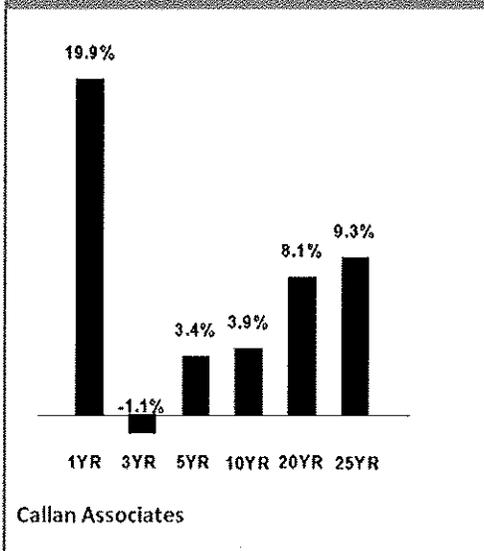
# NASRA Issue Brief: Public Pension Plan Investment Return Assumptions



*The issue of the investment return assumption used by public pension plans has been the focus recently of increasing attention. This brief explains the role this assumption plays in pension finance, how it is developed, and compares this assumption with public funds' actual experience.*

Some members of the media, academics, and policymakers recently have questioned whether public pension fund investment return assumptions are unrealistically high. If this were true, it could encourage these funds to take too much risk in investing pension fund assets, or it could understate the cost of pension liabilities, reducing their current cost at the expense of future taxpayers. Alternatively, an investment return assumption that is set too low would result in overstating liabilities, which would overcharge current taxpayers.

**Figure 1. Median annualized investment returns for periods ended 12/31/09**



Public retirement systems employ a process for setting and reviewing their actuarial assumptions, including the expected rate of investment return. Most systems review these assumptions regularly, pursuant to statute or system policy. The process for establishing and reviewing the investment return assumption involves consideration of various factors, including financial, economic, and market data. This process also is based on a very long-term view, typically 30 to 50 years.

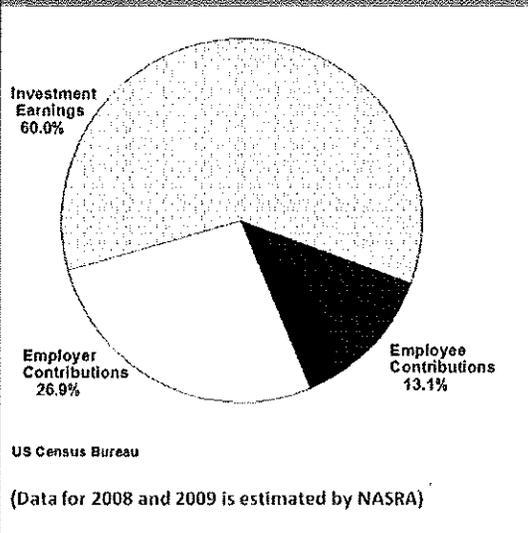
Although public pension funds, along with most other investors, have experienced sub-par returns over the past decade, median public pension fund returns over longer periods exceed the assumed rates used by most plans. As shown in Figure 1, median investment returns for the 20- and 25-year periods ended 12/31/09 exceed the most-used investment return assumption of 8.0 percent. For example, for the 25-year period ended 12/31/09, the median investment return was 9.25 percent.

## Why the investment return assumption is important

Public pension actuaries calculate a public pension plan's funding level and cost using assumptions about many future events that have a direct effect on the pension plan, such as the age when participants will retire, their rate of salary growth, how long they'll live after retirement, and how much the plan's investments will earn. Of all the assumptions used to estimate the cost of a public pension plan, none has a larger impact on the plan's costs than the investment return assumption. This is because over time, earnings from investments account for a majority of revenues for most public pension plans.

Figure 2 illustrates this important fact. Since 1982 (when the U.S. Census Bureau began reporting public pension fund revenue data), public pension funds have accrued an estimated \$4.4 trillion in revenue, of which \$2.64 trillion, or 60 percent, is estimated to have come from investment earnings. Employer (taxpayer) contributions account for \$1.2 trillion, or 27 percent of the total and employee contributions total \$578 billion, or 13 percent.

**Figure 2. Distribution of public pension fund revenue sources, 1982 to 2009**



## How the investment return assumption is developed

Public pension plans operate over long time frames and manage assets for many participants whose involvement with the plan can last more than half of a century. Consider the case of a newly-hired public school teacher, 25 years old. If this pension plan participant elects to make a career out of teaching school, he or she may work for 35 years, to age 60, and live another 25 years, to age 85. This teacher's pension plan will receive contributions for the first 35 years, then pay out benefits for another 25 years. During the entire 60-year period, the plan is investing assets on behalf of this participant. To emphasize the long-term nature of the investment return assumption, for a typical career employee, more than one-half of the investment income earned on assets accumulated to pay benefits is received *after* the employee retires.

The investment return assumption is established through a process that considers factors such as economic and financial criteria; the

plan's liabilities; and the plan's asset allocation, which reflects the plan's capital market assumptions and its risk tolerance. A public pension plan's actuary typically has considerable influence in setting the investment return assumption. Actuarial Standards of Practice No. 27, "Selection of Economic Assumptions for Measuring Pension Obligations," (ASOP 27), which provides guidance for professional actuaries in setting the investment return assumption (among other assumptions), recommends that actuaries consider such criteria as:

- current yields on government and corporate bonds;
- expected rates of inflation and returns for each asset class;
- historical investment data; and
- the plan's historical investment performance.

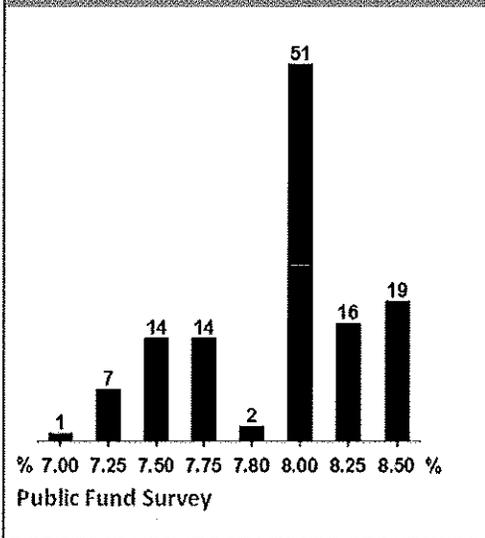
ASOP 27 further states that the actuary, in developing the investment return assumption, may consider "historical statistical data showing standard deviations, correlations, and other statistical measures related to historical returns of each asset class and to inflation;" and recommends that other factors be considered, including:

- the plan's investment policy—asset allocation, risk tolerance, target allocations, etc.
- expected volatility of the portfolio
- performance of managers investing the assets
- investment expenses
- projected timing and volatility of cash flows.

ASOP 27 also recommends the use of a range as part of the process of setting the investment return assumption:

*Because no one knows what the future holds with respect to economic and other contingencies, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes based on past experience and future expectations, and to select assumptions based upon that application of professional judgment. Therefore, an actuary's best-estimate assumption is generally represented by a range rather than one specific assumption. The actuary should determine the best-estimate range for each economic assumption, and select a specific point from within that range. In some instances, the actuary may present alternative results by selecting different points within the best-estimate range.*

**Figure 3. Distribution of public pension fund nominal investment return assumptions**



The investment return assumption reflects a value within the projected range, and is considered to be the best predictor of future experience. With an investment return assumption of 8.0 percent, there is a projected 50 percent chance of actual experience being above that figure, and an equal chance of falling below. A return assumption below the expected range would increase the plan's funding requirements, which would increase costs for current taxpayers (and plan participants), and would benefit future taxpayers and participants. Alternatively, an assumption that is too high would reduce the plan's costs in the near-term, at the expense of future taxpayers and plan participants.

Although investment return assumptions used by public pensions are intended to reflect long-term considerations, they are not static, and they do change. Until the 1980s, a majority of public pension assets were invested in bonds and other asset classes that yielded a lower projected return than a diversified portfolio of stocks, bonds, real estate, etc. Investment return assumptions were commensurately lower. First in response to high interest rates during the late 1970s and early 1980s,

then as a result of pension funds' movement into diversified portfolios with higher expected returns, investment return assumptions rose to reflect the higher expected real rates of return.

## Conclusion

Empirical results show that since 1985, a period that has included three economic recessions and four years when median public pension fund investment returns were negative (including the 2008 decline), public pension funds have exceeded their assumed rates of investment return. As the standard disclaimer says, past performance is not an indicator of future results. However, considering that public funds operate over very long timeframes, actuarial assumptions with a long-term focus should also be established and evaluated on similar timeframes. Viewed in this context, compared to actual results, public pension plan investment return assumptions have proven to be conservative.

The purpose of this issue brief is not to argue for any particular investment return assumption; fiduciaries for each plan have a responsibility to consider the range of factors that are used to establish this key assumption. Rather, this brief is intended to clarify how this assumption is established, to compare public funds' actual investment experience with investment return assumptions, and to describe how the suitability of this assumption should be evaluated.

## See Also:

"Actuarial Standards of Practice No. 27," Actuarial Standards Board,  
[http://www.actuarialstandardsboard.org/pdf/asops/asop027\\_109.pdf](http://www.actuarialstandardsboard.org/pdf/asops/asop027_109.pdf)

"The Liability Side of the Equation Revisited," Missouri SERS, September 2006,  
[https://www.mosers.org/~media/Files/Adobe\\_PDF/About\\_MOSERS/Board-Newsletters/Operations-Outlook/operations\\_outlook\\_September06.ashx](https://www.mosers.org/~media/Files/Adobe_PDF/About_MOSERS/Board-Newsletters/Operations-Outlook/operations_outlook_September06.ashx)

California State Teachers' Retirement System, "Analysis of Investment Return Assumption," February 2010, Milliman USA, [http://www.nasra.org/resources/CalSTRS\\_invreturnanalysis.pdf](http://www.nasra.org/resources/CalSTRS_invreturnanalysis.pdf)

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