

---

4-1-2012

## What Determines Public Pension Investment Risk-Taking Policy?

Nancy Mohan  
*University of Dayton*

Ting Zhang  
*University of Dayton*

Follow this and additional works at: [https://research.upjohn.org/empl\\_research](https://research.upjohn.org/empl_research)



Part of the [Labor Economics Commons](#)

---

### Citation

Mohan, Nancy, and Ting Zhang. 2012. "What Determines Public Pension Investment Risk-Taking Policy?" *Employment Research* 19(2): 5-6. [https://doi.org/10.17848/1075-8445.19\(2\)-2](https://doi.org/10.17848/1075-8445.19(2)-2)

This title is brought to you by the Upjohn Institute. For more information, please contact [repository@upjohn.org](mailto:repository@upjohn.org).

*Nancy Mohan and Ting Zhang*

# What Determines Public Pension Investment Risk-Taking Policy?

*See p. 7 for new and recent books on pension policy published by the Upjohn Institute.*

**S**tate public pension plans, mostly defined benefit plans, cover pension benefits for 12.8 million active public employees and 5.9 million retirees and other annuitants.<sup>1</sup> However, by the end of 2009, public pension plans had accumulated a total funding deficit of \$697 billion (measured by the difference between actuarial pension assets and liabilities). On average, public pension funds cover 75 percent of their liabilities, but individual state results vary greatly. The 2008 stock market crash strongly affected pension asset value in that equity allocation on average accounted for 56 percent of invested assets. The average 2009 pension asset beta of 0.63 suggests that if the market fell 35 percent (the drop experienced during the 2008 financial crisis), public plans would lose 22 percent of their total fund value.<sup>2</sup>

Therefore, an important yet largely overlooked issue related to pension underfunding is the investment risk level assumed by public pension plans. As shown in Figure 1, the state pension funds equity allocation varied greatly at the end of 2009, from 11 percent (South Carolina) to 69 percent (Nebraska and Mississippi). The current funding gap prompts the question of whether the pension fund managers will adopt riskier investment positions in hopes of raising returns and lowering the shortfall.<sup>3</sup>

This article summarizes our research that is reported in our Upjohn Institute working paper (Mohan and Zhang 2012). In it, we examine the determinants of pension risk-taking policy during the period 2001–2009 after taking into consideration state government incentives, political pressure, fiscal

constraints, public union presence, and workforce features.

## Factors Affecting Pension Funds Risk-Taking Policy

We measure pension risk as either the percentage of total plan assets invested in the equity market or pension asset beta. The more risk assumed by the fund manager (higher equity allocation or higher asset beta), the more sensitive the fund is to market volatility. So, what are the factors that could affect investment risk? One incentive may be risk management. When a pension fund is underfunded the state is obligated to increase contributions. Unexpected, required funding for pension contributions may reduce the ability to invest in schools or police, for example, because in the short run, the state/municipal budget is fixed. The implications are that, from a risk management perspective, states would prefer to have predictable pension contributions. Accordingly, asset allocation decisions would be a function of funding status—safe, well-funded plans could invest in more risky securities, while underfunded plans invest in less risky assets. Alternatively, there is a risk transfer element to consider: taxpayers are ultimately responsible for underfunded public pension plans, and governments may raise taxes to fund pension plans (Gold 2003).

Other factors may also affect risk-taking investment policy. Public pension plans have a unique set of issues to consider: politics, fiscal constraints, and public pension accounting. Political influence could pressure the fund to buy bonds issued by the state or local government or to direct funds to economically targeted investments.

And if these investments provide inefficient returns, then remaining assets may be invested in riskier securities. Furthermore, if states face fiscal limitations that restrict borrowing, pension fund debt may act as a substitute (Novy-Marx and Rauh 2009). Fiscal constraints also cause states to manipulate actuarial assumptions to lower required contributions (Eaton and Nofsinger 2004). Public pension plans are regulated by the government standard (GASB 25), which allows liabilities to be discounted at the assumed plan rate of return, which most commonly is 8 percent. Higher assumed returns reduce the discounted liabilities, which in turn reduces the required contributions. Accordingly, we label these factors political influence, fiscal constraint, and accounting effect.

Finally, we consider union membership, demographic make-up of employees, and follow-the-leader investment behavior. If union membership is associated with higher pension obligations, investment policy could become riskier in order to chase higher returns. From a demographic perspective, age and gender of plan participants may affect the risk-taking policy of the fund. In addition, investment managers tend to mimic each other. According to Park (2009), managers of public pension funds tend to follow peer group norms such that asset allocation to all equity hovers around 64–75 percent. Alternatively, public pension plan managers may follow the best performers or plans considered to be large and influential, such as CalPERS. We name these factors union effect, demographic effect, and herding effect.

## Summary of Our Results

We find that accounting standards strongly affect public fund investment risk, as higher return assumptions (used to discount pension liabilities) are associated with higher equity allocations and betas. In particular, a 100 basis point increase in pension return assumption is associated with a 1.72–4.51 percent increase in equity allocation. The corresponding increase in pension asset

beta given a same magnitude increase in the return assumption is 0.04–0.06, suggesting that an important incentive for the fund manager is justifying the liabilities discount rate.

Our results also suggest that public funds assume more risk if they are underfunded or have lower investment returns in the previous year, evidence consistent with risk transfer or intent to pass underfunded pension obligations to future taxpayers. This risk-taking policy is not necessarily in the plan participants' best interest. Taxpayers might ultimately be called upon to close the funding gap.

When states are constrained from issuing additional debt, underfunding pension funds may substitute for borrowing. And because states can justify a higher discount rate for liabilities through the assumed rate of return, states facing financial constraints may subsequently invest in riskier assets, resulting in higher pension plan betas and/or larger equity allocations. We find that pension funds in states facing financial constraints are more likely to take higher risk in their pension fund investment.

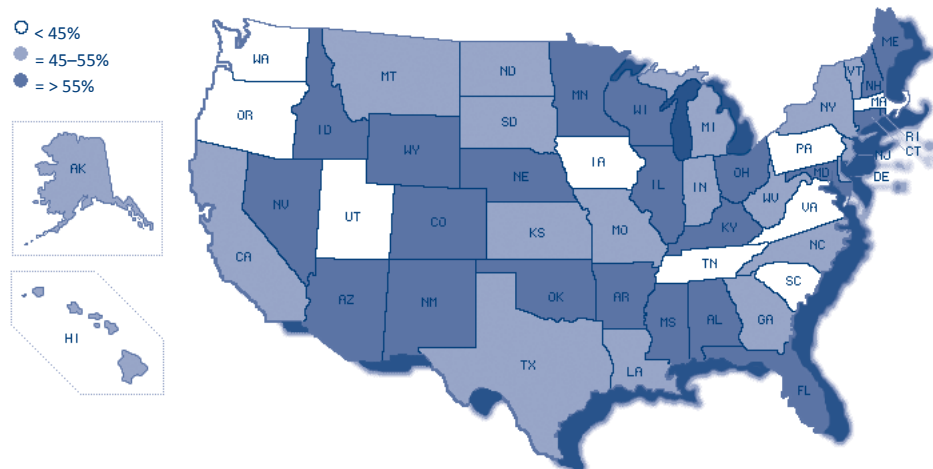
Our results suggest a degree of follow-the-leader in that plan managers tend to follow the risk-investing policy of large and high-profile plans (such as CalPERS). Furthermore, we report a mild public union effect; that is, in order to provide larger retirement benefits for unionized public employees, fund managers pursue a riskier investment allocation. Finally, limited evidence suggests that economically targeted investment policies are associated with lower pension investment risk.

Overall, our findings suggest that the risk levels of public pension funds are determined by various factors: incentives to justify the accounting discount rate choice, shifting pension risk to future tax payers, and substituting underfunded pension liabilities for borrowing. A first step towards addressing the problem would be to appropriately discount future liabilities.

### Notes

1. These figures are from November, 2011. The most current figures, as of February 2012, are 13.2 million active and 7.1 million

**Figure 1 State Pension Plans Equity Allocation as of Fiscal Year 2009**



SOURCE: Center for Retirement Research at Boston College (2011).

retirees and other annuitants. Data available from <http://www.publicfundsurvey.org/publicfundsurvey/scorecard.asp> (accessed March 6, 2012).

2. Beta measures the sensitivity of financial asset returns to the overall stock market change (i.e., using the S&P 500 index as a proxy). Pension asset beta captures the risk of a pension plan's exposure to alternative investments, including private equity, venture capital, hedge funds, and other alternative assets. It was first proposed by Jin, Merton, and Bodie (2006).

3. Allocation to private equity funds increased to 11 percent as of September 2011 (Corkery 2012).

### References

- Center for Retirement Research at Boston College. 2011. "Public Plans Database." Chestnut Hill, MA: Center for Retirement Research at Boston College. <http://pubplans.bc.edu/pls/html/db/f?p=198:3:3667012107971550> (accessed October 31, 2011).
- Corkery, Michael. 2012. "Public Pensions Increase Private-Equity Investments." *Wall Street Journal*, January 26, C:1.
- Eaton, Tim V., and John R. Nofsinger. 2004. "The Effect of Financial Constraints and Political Pressure on the Management of Public Pension Plans." *Journal of Accounting and Public Policy* 23(3): 161–189.
- Gold, Jeremy. 2003. "Risk Transfer in Public Pension Plans." In *The Pension Challenge: Risk Transfers and Retirement Income Security*, Olivia S. Mitchell and Kent Smetters, eds. New York: Oxford University Press, pp. 102–115.
- Jin, Li, Robert C. Merton, and Zvi Bodie. 2006. "Do a Firm's Equity Returns Reflect the Risk of Its Pension Plan?" *Journal of Financial Economics* 81(1): 1–26.
- Mohan, Nancy, and Ting Zhang. 2012. "An Analysis of Risk-Taking Behavior for Public Defined Benefit Pension Plans." Upjohn Institute Working Paper No. 12-179. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
- Novy-Marx, Robert, and Joshua D. Rauh. 2011. "Public Pension Promises: How Big Are They and What Are They Worth?" *Journal of Finance* 66(4): 1211–1249.
- Park, Youngkyun. 2009. "Public Pension Plan Asset Allocations." *Employee Benefit Research Institute Notes* 30(4): 1–12.
- Nancy Mohan is an associate professor of finance and Ting Zhang is an assistant professor of finance, both at the University of Dayton.*