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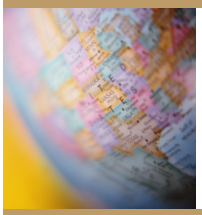

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State and Local Pension Plans

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IMPACT OF PUBLIC SECTOR ASSUMED RETURNS ON INVESTMENT CHOICES

*By Jean-Pierre Aubry and Caroline V. Crawford**

Introduction

State and local pension plans use their assumed investment return – 7.4 percent, on average, in 2017 – to value liabilities and calculate required contributions. Prior studies have suggested that this practice results in overly risky portfolios as plan sponsors seek higher returns to reduce their reported liabilities and required contributions.[1] A separate, but related, issue is that – for any given asset allocation – this use of the assumed return could also provide an incentive for plans to take a rosy view of future returns for their investment portfolio. Given these concerns, this *brief* investigates two questions. First, does using the assumed return to value liabilities and set contributions lead to riskier asset allocation? Second, given the asset allocations of public plans, are their assumed returns overly optimistic?

The discussion proceeds as follows. The first section introduces the data and methodology, explaining why comparing public plans to private plans is useful for this analysis. The second section explores the hypothesis that using the assumed return to value liabilities and set contribution targets leads to riskier asset allocation. Given their allocation, the third section explores whether public plan return assumptions are reasonable by comparing them to those of investment experts. The final section concludes that public plans invest in riskier assets than private plans – and that much of the difference is related to unobservable differences between the sectors, including how they use the assumed return. Additionally, given the asset allocation of public plans, their return expectations are on the optimistic end of the assumptions of investment experts.

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Data and Methodology

To isolate how public plans' investment return assumptions affect their asset allocation, the analysis compares public plans to single-employer private defined benefit (DB) plans. Private plans do not use the assumed return to value liabilities in their financial statements (see Table 1). And, as a result of the Pension Protection Act (PPA), in 2009 they stopped using it to set required contributions as well. Therefore, a private sector comparison can provide insight into how using the assumed return for valuation and funding purposes may impact public sector asset allocation.[2]

Table 1. Use of the Assumed Return for Public and Private Plans, 2001-2018

Period	Value liabilities		Set contributions	
	Public	Private	Public	Private
2001-2008	✓		✓	✓
2009-current	✓		✓	

Sources: American Academy of Actuaries (2004); FASB 87; FASB 132(R); and GASB 25 and 27.

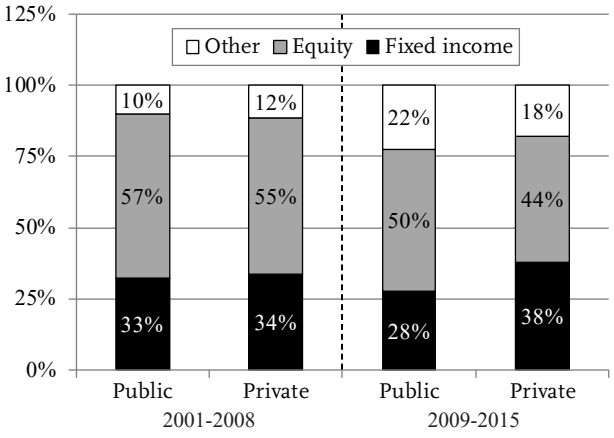
This analysis combines publicly available data to create a dataset on public and private plans and their sponsors.[3] For public plans, the analysis relies on the *Public Plans Database* for information on 180 state and local pension plans, representing 95 percent of assets and membership in the public plan universe. For data on the finances of the governments that sponsor these plans, the analysis uses the U.S. Census Bureau's *Annual Survey of State and Local Government Finances*. For data on private plans, the analysis relies on the U.S. Department of Labor's *Form 5500*, which contains detailed information on asset allocation, cash flows, membership, and funding costs for all tax-exempt private retirement plans. For data on the sponsors of these private plans, the analysis relies on the Standard & Poor's (S&P's) Compustat dataset.

Because the average public and private sector plan differ meaningfully in terms of asset size and maturity, one must consider the private sector sample carefully. To focus on a sample of private plans that are more comparable to public plans, the analysis includes only private plans that have at least $1 billion in assets and remain open (i.e. the plans have not been terminated or frozen). Even so, the average private plan in this analysis remains somewhat smaller and more mature than the average public plan. While this sample represents a small share of private DB plans, it covers around half of membership, assets, and liabilities.[4]

Are Assumed Returns Related to Riskier Asset Allocation?

From 2001-2008, the average allocation to fixed income, stocks, and other non-traditional asset classes – alternatives such as private equity, hedge funds, and real estate – was roughly the same for public and private plans (see Figure 1).[5] However, from 2009-2015, the allocations diverged, with public plans investing a significantly larger share in risky assets than private plans. Specifically, in this latter period, public plans had 72 percent in risky assets (50 percent in equities + 22 percent in alternatives) compared to 62 percent for private plans (44 percent in equities + 18 percent in alternatives).

Figure 1. Average Asset Allocation for Sample of Plans, by Sector, 2001-2008 and 2009-2015



Note: Sample covers open plans with ≥ $1 billion in assets.
Sources: Authors' calculations from S&P's Compustat (2001-2015); U.S. Department of Labor, *Form 5500* (2001-2015); and *Public Plans Database* (PPD) (2001-2015).

The question is how much of the difference in allocation to risky assets is due to differences in the incentives regarding the assumed return. Other factors could also explain the difference. For example, in 2015, the average percentage of inactive members – current retirees and separated employees entitled to a retirement benefit – for private plans was about 12 percentage points higher than the average for public plans, and prior research suggests that risk tolerance should be lower for more mature plans.[6]

To control for these other factors, this study uses a regression analysis. The dependent variable for the regression is the percentage of total plan assets in risky assets (i.e., all assets excluding bonds and cash). The independent variables, described below, include many of the determinants of pension asset allocation used in prior research.[7] In addition, the regression includes a public plan indicator to capture the effect that any remaining differences between the two sectors, including the use of the assumed return, have on asset allocation.

- *Health of plan*. The ratio of plan assets to annual benefit payments is used as a simple proxy of the funded status of a plan. Using this metric – rather than a plan's funded ratio – avoids the need to adjust liability numbers for differences in the discount rates among plans. As plan funding declines, plans may choose to increase risk in hopes of higher returns. Or, alternatively, they may reduce risk to lower the potential for default.[8]

- *Health of plan sponsor.* The S&P credit rating broadly captures the fiscal health of the plan sponsor. As with plan health, a plan may respond to declining sponsor health by either increasing or decreasing portfolio risk.

- *Debt obligations of plan sponsor.* The plan sponsor's ratio of debt to revenue captures the sponsor's burden from non-pension obligations. Plans may respond to a higher debt-to-revenue sponsor ratio by taking on more risk in their portfolio to reduce average funding costs or, instead, by reducing risk to limit potential volatility of pension contributions.

- *Plan size*. The ratio of plan assets to sponsor revenue captures the potential impact of plan size on sponsors. The increased contribution volatility stemming from risky assets may be more tolerable for plans that are small relative to their sponsor. Conversely, the allocation to risky assets may rise with size to reduce the cost of a big plan with large contributions.

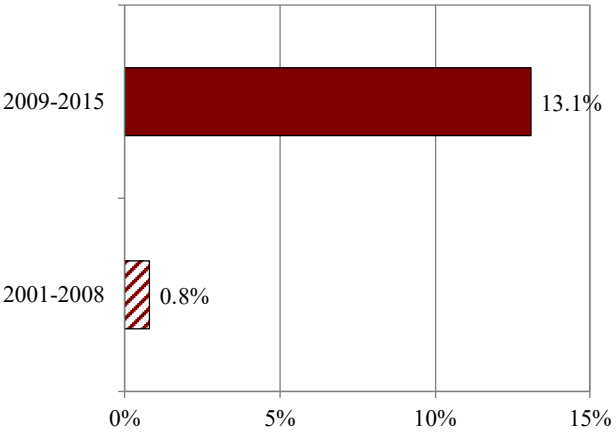
- *Plan maturity.* The percentage of retired and inactive participants reflects the age profile of the plan. Prior research has found that plans take on less investment risk as the share of inactive members increases and liabilities come due sooner.

- *Risk-free rate of return*. The 10-year Treasury yield captures the return on safe assets. The higher the return on safe assets, the less incentive plans have to invest in risky assets to obtain a given rate of return.

- *Public plan indicator.* The public plan indicator captures the effect of any remaining differences between the two sectors, including how the public sector uses the assumed return relative to the private sector.

Figure 2 (on the next page) reports the effect of the public plan indicator for regressions spanning two separate time periods: 2001-2008, when private plans used the assumed return for setting contribution targets, but not for valuing liabilities; and 2009-2015, when private plans did not use the assumed return for either valuing liabilities or setting contribution targets. The regression finds no significant effect for the public plan indicator for 2001-2008, but shows a 13-percentage-point difference in allocation for 2009-2015, much like the pattern found in the raw data.[9] Of course, despite the effort to control for differences in public and private plans that are unrelated to the use of the assumed return, the public plan indicator could still capture the effects of other differences between the two sectors that are difficult to measure.[10]

Figure 2. Percentage-Point Difference in the Allocation to Risky Assets for Similar Public and Private Plans, 2001-2015



Note: The solid bar is significant at the 1-percent level. The sample covers open plans with ≥ $1 billion in assets.
Sources: Authors' calculations from Compustat (2001-2015); *Form 5500* (2001-2015); PPD (2001-2015); and Census, *Annual Survey of State and Local Government Finances* (2001-2015).

Are the Assumed Returns Used by Public Plans Too Optimistic?

Even given the riskier asset allocation of public sector plans, many investment experts contend that their assumed returns are too high. And, because public plans use the assumed return to set funding policies, optimistic return expectations could undercut their financial stability through inadequate contributions.

This analysis assesses the credibility of return expectations by comparing the public sector's assumed return to an assumed return based on published expectations from BlackRock (see Table 2). The first column simply shows the average asset allocation and average assumed return for a public sector plan. The second and third columns show optimistic and pessimistic return expectations that are constructed using BlackRock's expectations by asset class, weighted by the public sector's average allocation. For example, for equities, BlackRock predicts 7.4 percent for U.S. large cap, 8.0 percent for global excluding U.S. large cap, 7.8 percent for U.S. small cap, and 9.0 percent for emerging markets. Using these data, the optimistic estimate reflects an upper bound by assuming equity returns equal 9.0 percent, meaning all equities are in emerging markets, and the pessimistic estimate reflects a lower bound by assuming all equities are in U.S. large cap stocks.[11]

The takeaway is that the average assumed return for a public plan is 7.4 percent, which equals the optimistic expectations constructed from the BlackRock data.[12]

Table 2. Average Asset Allocation and Assumed Returns (Nominal) for Public Plans Compared to BlackRock Expectations, 2017

Asset class	Public plans avg. allocation	BlackRock returns	
		Optimistic	Pessimistic
Equity	49.1%	9.0%	7.4%
Fixed income	22.7	6.0	2.4
Real estate	7.0	5.2	5.2
Misc. alternatives	1.3	10.0	3.9
Private equity	7.4	10.0	10.0
Hedge	6.9	3.9	3.9
Commodities	2.9	4.4	4.4
Cash	1.8	2.0	2.0
Estimated return	7.4%	7.4%	5.8%

Sources: PPD (2017); and BlackRock (2018).

Conclusion

Prior studies have hypothesized that the use of the assumed return by public pension plans to value liabilities results in overly risky portfolios as public plans may seek to justify a higher expected return to reduce both their reported liabilities and required contributions. Additionally, given their asset allocation, many investment professionals foresee returns below the 7.4-percent return assumed by public plans. Given these concerns, this *brief* explored two questions. First, do public sector plans invest in riskier assets due to the incentives regarding the assumed return? Second, given their allocation, are their assumed returns overly optimistic?

On the first question, the *brief* finds that public plans have a riskier portfolio relative to private plans, which do not use the assumed return in the same way. A regression analysis suggests that much of the difference in allocation is related to unobservable differences between the two sectors, including the public sector's use of the assumed return. On the second question, the assumed returns of public sector plans are on the optimistic end of the assumptions of investment experts. This situation is worth monitoring closely because optimistic return expectations could yield required contributions that are ultimately inadequate to meet benefit obligations and, thus, threaten the financial stability of public plans.

Endnotes

1 For example, see Andonov, Bauer, and Cremers (2017).

2 Private plans do use the assumed return to calculate their pension expense – an accounting measure that has no parallel in the public sector. All else equal, a higher assumed return in the private sector reduces the pension expense. As such, results from the comparison of public and private plans likely understate the effect of removing the valuation and funding incentive because of the private sector's remaining incentive to reduce the pension expense.

3 Including data on plan sponsors provides a more holistic view of factors that may, in practice, affect a plan's investment decisions, such as the size of the plan relative to the sponsor and/or the sponsor's financial health. See Rauh (2006, 2009).

4 The sample represents less than 5 percent of the private sector DB plans in the *Form 5500* from 2001-2015, but about 47 percent of DB plan membership, 58 percent of DB plan assets, and 53 percent of DB plan liabilities.

5 For details on how asset allocation was derived from the *Form 5500*, see Munnell, Aubry, and Crawford (2015).

6 In 2015, the public and private plans in our sample had 49 percent and 61 percent inactives, respectively.

7 See Andonov, Bauer, and Cremers (2017) and Rauh (2009) for prior analyses on pension asset allocation.

8 Risk-shifting and risk-management provide the basic frameworks for considering the way that the financial condition of a plan and/or plan sponsor might impact the pension fund's asset allocation. The risk-shifting framework posits that, as conditions worsen, the entity invests in riskier assets because it will benefit exclusively from the upside (through reduced costs), while the downside will be borne by creditors (bondholders and, in this case, plan participants). The risk-management framework posits that entities reduce risk as conditions worsen in order to reduce the potential for default on obligations to bondholders and/or plan participants. An important check on the practice of risk-shifting is that, in the absence of dramatic losses, the downside is absorbed by the plan and the sponsor through increased costs.

9 In general, the regression controls in our analysis were insignificant. See Appendix for full results. Both Rauh (2009) and Andonov, Bauer, and Cremers (2017) find that plan maturity is negatively related to investment in risky assets. Rauh (2009) – which focuses on small and medium private sector plans from 1990-2003 – also finds that worse funded plans (and plans with sponsors that had worse credit ratings) had a lower allocation to equities. The regression results in our analysis find a positive relationship between plan maturity and risky assets for 2001-2008, and no relationship for 2009-2015. The regression did find that worse funded plans had a lower allocation to risky assets, but only in 2009-2015. Additionally, the regression found that plans with sponsors that reported worse credit ratings invested less in risky assets, but only in 2001-2008. The difference between the results of this study and prior work may be that the past research included the 1990s in their analysis, while this study focuses on data from 2001 forward. Also, as noted, this analysis excludes private sector plans with less than $1 billion in assets and plans that are closed or frozen.

10 These other unobserved differences between public and private plans could include factors such as plan sponsor durability, revenue streams, and other key sustainability qualities. Additionally, the methods of fiscal oversight of governments and government pension plans (municipal bond analysts and taxpayers) differ from those of private sector firms and pension plans (stockholders, the U.S. Securities and Exchange Commission, and the U.S. Department of Labor).

11 BlackRock's methodology for calculating long-term return expectations is available at: https://www.blackrock.com/corporate/literature/whitepaper/bii-capital-market-assumptions.pdf. The results based on BlackRock's expectations are consistent with results based on the 10- and 20-year return expectations reported in the most recent Horizon Actuarial report, which are derived from a survey of return expectations for 34 investment firms. (Horizon Actuarial Services, LLC (2018) and BlackRock (2018)).

12 The fact that the long-term return assumed by actuaries is at the high end of those published by investment consultants could be due to the fact that actuaries and plans are slow to move the long-term assumed return in any direction, rather than a deliberate optimism. A good current example of this pattern is CalPERS. The plan has acknowledged a lower return expectation than it currently uses, but has chosen to implement a glide path toward that lower expectation over many years.

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APPENDIX

Table A1. Effect of Plan and Sponsor Characteristics on the Percentage that Pension Plans Allocated to Risky Assets, 2001-2015

	2001-2008	2009-2015
Health of plan (plan assets to benefits)	0.000**	0.001**
	(0.028)	(0.018)
Health of plan sponsor (S&P credit rating)	0.014	-0.045**
	(0.404)	(0.021)
No S&P credit rating	-0.040***	-0.019
	(0.004)	(0.225)
Debt obligations of plan sponsor (debt to revenue)	0.003	-0.000
	(0.478)	(0.975)
Plan size (plan assets to sponsor revenue)	0.002	-0.002
	(0.498)	(0.609)
Plan maturity (% of participants who are inactive)	0.091***	0.012
	(0.000)	(0.637)
Risk-free rate of return (yield on 10-year Treasury)	-2.024***	-2.101***
	(0.003)	(0.002)
Public plan indicator	0.008	0.131***
	(0.453)	(0.000)
2002.fy	-0.050***	
	(0.002)	
2003.fy	-0.073***	
	(0.003)	
2004.fy	-0.061**	
	(0.035)	
2005.fy	-0.047*	
	(0.057)	
2006.fy	-0.005	
	(0.742)	
2007.fy	0.029***	
	(0.002)	
2008o.fy	-	
2010.fy		-0.002
		(0.813)
2011.fy		0.014
		(0.184)
2012.fy		0.003
		(0.769)
2013.fy		0.011
		(0.327)
2014.fy		0.024**
		(0.038)
2015o.fy		-
Constant	0.711	0.619
R-squared	0.040	0.136
Observations	2,304	2,134
Number of plans	402	386

Note: Statistically significant at the 10-percent (*), 5-percent (**), or 1-percent level (***).
Sources: Authors' calculations from Compustat (2001-2015); *Form 5500* (2001-2015); PPD (2001-2015); and U.S. Census Bureau (2001-2015).

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