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Chairperson's Corner

By Bruce D. Schobel

NEW MISSION STATEMENT

The SIPF section council's first project for 2018 was developing a new mission statement. The old statement dated back to the section's formation a decade ago and needed some tweaking. After several months of discussion, the council agreed on a new statement, which had to be approved by the SOA's Board of Directors. That happened at the Board's March meeting. The new mission statement says:

> *The purpose of the section is to develop consistent, high quality continuing education opportunities and sponsor fundamental research into evaluating and managing (1) social insurance programs and (2) benefit plans for government employees and the role of such benefit plans in public finance. Programs within the section's purview include social security, government-administered health plans such as Medicare and Medicaid, and other government-sponsored pension and health benefit plans. The section's purview is not limited to programs in the United States.*

A few aspects of the new statement are worth noting. First and unsurprisingly, it does not represent a fundamental change of direction for the section. The first sentence of the new mission statement is substantively unchanged from the old one. The next two sentences define the section's purview with some precision that was previously lacking. Our interest in Social Security, Medicare and Medicaid was always obvious, but the boundaries of our interest in other government-sponsored benefit plans is now much clearer. Finally, because the SOA is an **international** organization with members all around the world, we need to emphasize that the section's area of interest is not limited to programs within the United States.

The next step for the section council is ensuring that the section's activities are consistent with and well matched to our mission, as newly stated. Most of our activities involve continuing education, though research is not neglected. Continuing education is provided in basically three ways: (1) articles in this semiannual newsletter, *In the Public Interest;* (2) webinars, which we produce four to six times a year; and (3) sessions at SOA meetings, especially the annual meeting, which will be in Nashville, Tenn., this year (October 14–17, 2018). Deciding which format is best suited to delivering a particular topic is an interesting process.

Newsletter articles have some advantages over the other two possibilities. First, they are easily accessed, on paper or on-line, for a long period of time, making them well suited to material that has lasting value, as opposed to issues with short shelf lives. Examples of those might include status reports on developing legislation or even reports on the financial status of Social Security, which gets updated frequently enough that looking back at old reports may have limited value to most people. Newsletter articles are also peer-reviewed.

Webinars are also accessible for a while, through recordings that section members can access for free and non-members can buy. But listening to a recording is not as easy or convenient as reading an article. Still, webinars have their own advantages. They can be developed rather quickly, without the long lags associated with a semiannual newsletter. And, best of all, participants can ask questions real-time! That's impossible with a newsletter article.

Meeting sessions are the third option. Meetings are scheduled far in advance, so they share the issue of long time lags with newsletter articles. It's not easy (though not impossible, either) to present breaking news at an annual meeting session. Meeting sessions do have the great advantage, even better than webinars, in that they allow considerable face-to-face interaction between presenters and the audience. Some of the most valuable information comes out during question-and-answer periods.

Any suggested topic that the council agrees is of interest to our members goes through the process of determining which presentation format would be best, considering the somewhat contradictory considerations of timeliness and permanence. As we set our agenda throughout the year, we always think about how material should be delivered. The parent SOA does the same thing on a much larger scale.

I urge you to help us in these efforts by reading and contributing to this newsletter, subscribing to and presenting webinars, and attending and presenting at our meeting sessions. Together, we can fulfill our mission of delivering high quality continuing education material and sponsoring fundamental research of interest to our members. I look forward to working with all of you.

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Are Most Teachers Better Off With a DB Pension, 401(k), or Cash Balance Plan? The Case of CalSTRS

By Nari Rhee and William B. Fornia

Most public school teachers in the U.S. are covered by traditional defined benefit (DB) pensions designed to reward long service. Several studies have been released in recent years that argue that "most teachers" do not receive meaningful pension benefits—e.g., McGee and Winters (2013 and 2015), Aldeman and Rotherham (2014), Johnson and Southgate (2015), Aldeman and Johnson (2015), Costrell and Mcgee (2016), and Luecken (2017).[1] These studies cite high turnover among new-hire cohorts as the basis for claiming, as Aldeman and Johnston (2015) do, that "most teachers get nothing from their pensions" under a Final Average Salary (FAS) DB pension given its back-loaded benefit structure.[2]

A major failing of these studies is that they conflate new hire cohorts with the teaching profession as a whole. When policymakers, parents and the public think about teachers, they generally think about those working in classrooms today—that is, they think about the teaching workforce. Understanding how retirement plan design affects the teaching profession requires looking at a representative cross-section of the teaching workforce, weighted by teaching position, not just by new entrant.[3] Only then can we understand whether most teaching jobs are held by foot-loose itinerants who are better off with Defined Contribution (DC) plans, or those committed for the long haul who stand to benefit from a traditional DB pension.

In this study, we ask whether most teachers currently working in California public schools can expect to stay long enough to accrue higher benefits under their pension than alternative retirement plans with the same expected cost and the same capital market assumptions.[4]

We first project the distribution of currently active teachers by age and years of service at withdrawal or retirement. We then model retirement benefit outcomes for teachers at different entry ages under the California State Teachers' Retirement System (CalSTRS) DB pension, an idealized 401(k) plan, and an exceptionally generous cash balance (CB) plan that offers a guaranteed interest rate equal to the CalSTRS DB pension expected return. The alternative plans are assumed to receive contributions equal to the normal cost for retirement benefits provided by the CalSTRS DB pension. Finally, we estimate the share of teachers who, based on age and years of service at exit, would receive higher retirement income from the CalSTRS pension than the idealized 401(k) and CB plan.

Importantly, while we do not fully account for the value of the DB pension guarantee during the accumulation phase, we calculate retirement income outcomes on apples-to-apples terms by converting DC and CB account balances to a life annuity, priced with CalSTRS-specific mortality assumptions and (for DC) a reasonable rate for private insurance group annuities.

We find that most California teachers can expect a long career: 73 percent of teachers can expect to work at least 20 years, and 46 percent can expect to work at least 30 years. Furthermore, 83 percent of the California teacher population will stay until age 55, early retirement age. Even on an entering cohort basis, controlled for age, half of current new hire teachers in California (50 percent) are better off with the DB pension than the idealized DC plan. Ultimately, 85 percent of California's teaching population will accrue higher benefits under the CalSTRS DB pension than through an idealized 401(k), and 76 percent will accrue higher benefits than through a generous CB plan.

The remainder of this article is organized as follows. The following section analyzes teacher turnover and tenure based on the current demographics of the California teaching workforce. The next section describes our alternative benefit modeling methodology and results. Finally, we apply the benefit modeling results to our tenure analysis to estimate the share of currently active teachers that are better off in the DB plan, versus an idealized DC plan and generously structured CB plan.

TURNOVER AND TENURE AMONG CALIFORNIA TEACHERS

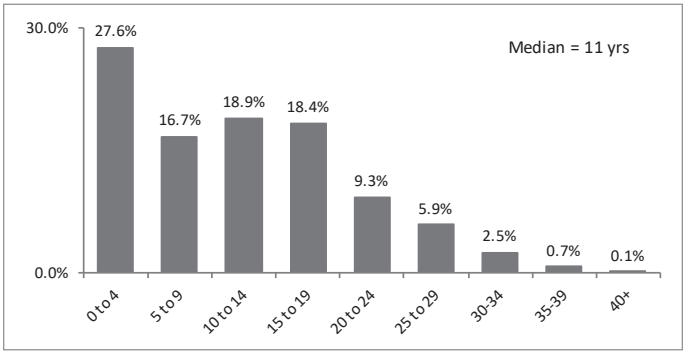
We obtained the following data from CalSTRS: detailed age-service tables for the active membership as of FY 2016; detailed actuarial assumptions adopted in 2016, including annual death, disability, withdrawal, and retirement rates, contingent on age and accrued service years, based on recent CalSTRS experience. We also obtained anonymized microdata for FY 2014 that includes each CalSTRS active member's accrued service credits, hire date, and birth year and month. For our tenure analysis, we conducted a survival analysis by applying the actuarial assumptions to the teacher counts in the age-service table in order to calculate the final age-service distribution, at exit, of currently active teachers.

Current Age And Service Profile

There are currently over 438,000 teachers working in California public schools, community colleges, and state and county job-training programs, based on the CalSTRS active membership count for the fiscal year ending June 30, 2016. Half of active teachers have 11 full years of service or less in California schools (**Figure 1**). Nearly 28 percent of the teacher population in our analysis is a relatively recent hire, with less than five years of service credits as of the end of the 2015–2016 school year.

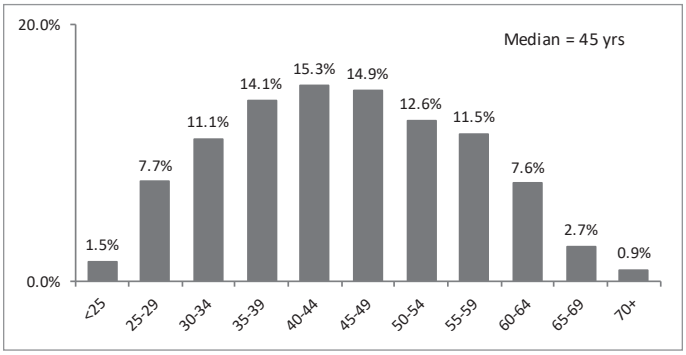
Although the service distribution is skewed towards recently hired teachers, the age distribution of the California teaching workforce mirrors the college-educated labor force, with a median age of 45 years (**Figure 2**). Looking at the age distribution of teachers hired in FY 2014, the mode is clearly age 25, but there is a long right-hand tail; thus the median is 29.2 years, and the mean is 32.7 (**Figure 3**).

Figure 1
Accrued Service Years Among California Teachers



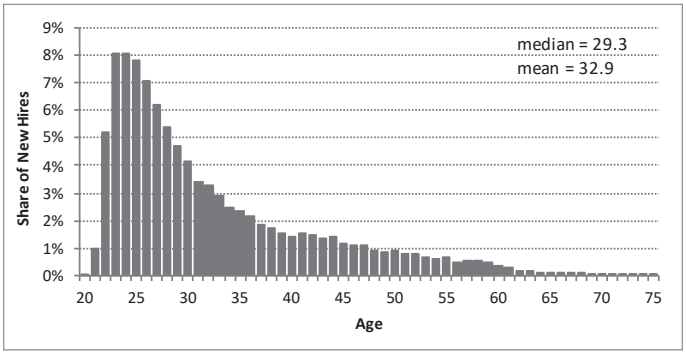
Note: Authors' analysis of CalSTRS active membership data as of June 30, 2016.

Figure 2
Age Distribution of California Teachers



Note: Authors' analysis of CalSTRS active membership data as of June 30, 2016.

Figure 3
Age Distribution of California New Hire Teachers



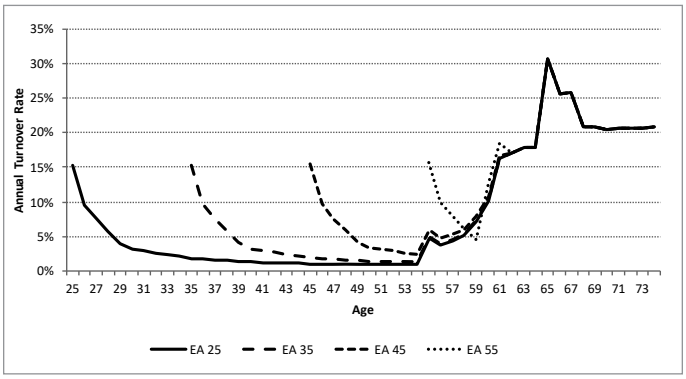
Note: Authors' analysis of CalSTRS active membership microdata for FY 2014.

Turnover And Tenure Analysis

We combined CalSTRS' separation, retirement, disability and pre-retirement mortality rates to construct survival curves for each age-service cohort in the active membership table, and projected the active membership counts in each cohort forward until age 75, when CalSTRS actuaries assume all surviving teachers will retire. We assumed that teachers who are currently age 75 or older will retire immediately.

Turnover rates indicate that retention of California teachers within the state as a whole is remarkably high after the initial churn of the pre-vesting years. **Figure 4** illustrates turnover by entry age. Turnover is highest in the first three years after hire, and then decreases dramatically until early retirement age. Indeed, for teachers hired at age 25, the cohort turnover rate for most years between vesting and age 55 is roughly 1 percent.

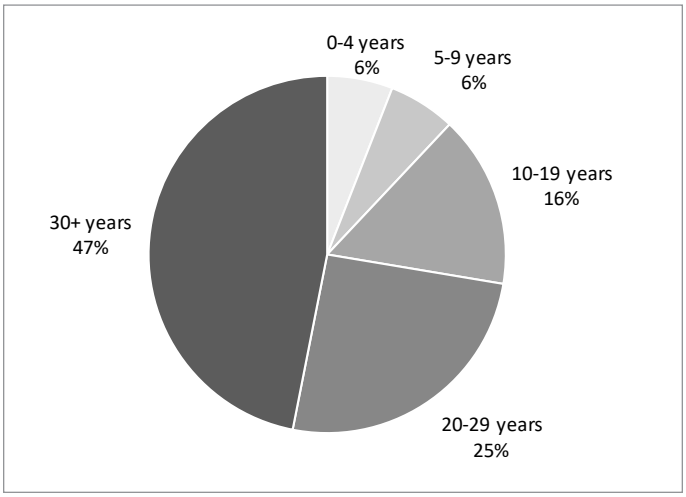
Figure 4
Age-Specific Turnover Rates, by Entry Age



Note: Authors' analysis of CalSTRS actuarial assumptions adopted FY 2016. Data reflect weighted average of male and female turnover rates.

When the careers of the current teaching workforce are projected forward, it turns out that the vast majority of California teachers can expect a long teaching career in the state, and that the typical California teacher will stay until retirement age. Nearly half (47 percent) of the teaching workforce will have earned at least 30 years of service by the time they leave the California schools (**Figure 5**). One-quarter (25 percent) will leave with 20 to 29 years of service. These add up to 72 percent of teachers staying at least 20 years. Only 6 percent will leave without vesting, and 22 percent will leave with five to 19 years of service.[5]

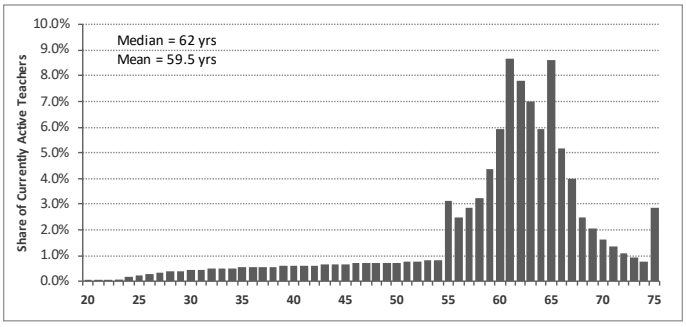
Figure 5
Projected Tenure of Current California Teachers



Note: Authors' analysis based on CalSTRS active membership data and actuarial assumptions as of June 30, 2016.

Figure 6 illustrates the distribution of projected exit ages among currently active teachers. The median projected exit age is 62 years, and the mean is 59.5. Before age 55, the share of the total current teaching workforce that will leave each year is miniscule, under 1 percent annually until age 54. A large majority of California teachers (83 percent) will leave when they are at least 55 years old, and virtually all of this group (82 percent of active teachers) will have vested by then.

Figure 6
Projected Age at Exit Among Current California Teachers



Note: Authors' analysis based on CalSTRS active membership data and actuarial assumptions as of June 30, 2016.

Our analysis shows that the vast majority of classroom teaching in California is performed by teachers who are well positioned to benefit from a traditional pension because they work a full career, or work mid-to-late-career in the state, when it is most advantageous to be covered by a traditional pension. Only a small percentage of teaching positions are occupied by those who leave before accumulating substantial service, or leave well before retirement age. This has profound implications for how the CalSTRS DB pension measures up against alternative benefits, as we demonstrate in the next section.

ALTERNATIVE RETIREMENT BENEFIT MODELING

Given tenure patterns among California teachers, how would they fare under a DC or CB plan, compared to the existing CalSTRS DB pension? In order to answer this question, we first modeled DB, DC and CB benefit curves for multiple entry ages in order to identify "crossover points" when the DB plan becomes more valuable than alternative plans. We then applied these crossover points to the projected exit age and service year distribution generated above, in order to calculate the share of active teachers who are better off with the DB plan.

Benefit Modeling Methodology

We modeled DC and CB outcomes based on a fixed contribution rate of 16.5 percent of pay, equal to the current normal cost for retirement benefits and withdrawal benefits provided under CalSTRS.[6] We also modeled employee-funded DC benefits based on the new employee contribution rate of 10.205 percent, in order to calculate the "break-even" point for employee contributions to the DB plan compared to the DC plan. We used CalSTRS-derived internal assumptions regarding increases in salary and post-retirement longevity.

In the CalSTRS DB plan, the employer bears all investment and longevity risk, and benefit accrual is tied to number of service years, age and final average salary. We modeled the lowest benefit tier, enacted in 2012 for new hires: 2 percent at age 62, with reduced benefit eligibility at age 55. The vesting period for all tiers is five years. We identified the maximum benefit available to teachers upon separation—whether an employee contribution refund with interest, lump sum cash-out or the pension annuity. Teachers who leave before vesting are eligible only for employee contribution refunds with interest. We assumed that refunds and cash-outs are immediately rolled over into the same Target Date Fund (TDF) that we modeled for the DC plan.

For vested teachers exiting between ages 55 and 59, we compared the value of pension benefits for immediate retirement and retirement at age 60, and chose the option with the greater value. Vested teachers exiting before retirement eligibility were assumed to wait until age 60 to claim benefits. (While it is generally more valuable for terminating employees to take benefits as soon as they are eligible, this is consistent with actual practice among CalSTRS members.) All those projected to separate at age 60 or older were assumed to start collecting benefits immediately.

Retirement benefits in all three plans are taken as a lifetime income equivalent to the CalSTRS pension retirement annuity, which includes a 2 percent fixed annual cost-of-living adjustment. Further details can be found in the Appendix.

For the DC plan, we used a generous set of financial and behavioral assumptions and assumed that the employer bears no investment or longevity risk:

Asset allocation and investment returns. All funds are invested in a TDF, which gradually shifts asset allocation from mostly stocks to mostly bonds as a worker approaches retirement age. The asset allocation glide path that we modeled represents a typical private market TDF, and the resulting portfolio is more aggressive than the DB plan for the first half of a typical career. We calculated the geometric mean (dollar-weighted) portfolio returns based on asset class average return and volatility data from CalSTRS's capital market assumptions (CMA), obtained from the pension plan's consulting actuary. Because CalSTRS forced its discount rate 25 basis points lower than the projected median return for the DB pension fund based on these same capital market assumptions, expected returns used in our DC model are more optimistic than the assumptions applied to the DB plan.[7]

Fees. We assumed a low "all-in" expense ratio of 0.25 percent (25 basis points) for combined investment and administrative costs. This is in line with the average for large, well-managed plans, but considerably lower than the fees paid by California teachers under the current voluntary 403(b) system.

Participant behavior. In the baseline (Ideal DC) scenario, participants exercise perfect discipline, maintaining the target asset allocation and committing none of the common mistakes made by individual investors, such as taking pre-retirement loans and withdrawals, chasing returns and selling off assets during market downturns. For the less optimistic (Real DC) scenario, we assumed a one percentage point reduction in net returns in addition to fees. This is a conservative estimate given that an average of 1.5 percent of DC plan assets leak out each year, and that individual investor level returns trail the asset classes in which they are invested by an estimated 0.9 to 4 percentage points (Kinnel 2014).[8] For both scenarios, we assume 16.5 percent of salary is contributed consistently.

Annuitization. In order to facilitate an apples-to-apples comparison with the DB plan, we assumed that the entire account balance at retirement is used to purchase a private insurance immediate annuity equivalent to the lifetime income stream provided by CalSTRS. In this way, we incorporate the value of the longevity insurance that is one of the key benefits of a DB pension.[9] We assumed a generous interest rate of 5 percent, which aligns with historical and projected long-term averages, but which significantly exceeds market interest rates in the low-interest environment that has persisted since 2008. We assume a cost (load) of 0.5 percent of the annuitized amount, in line with pricing for group annuities.

For the CB plan, we assumed a generous guaranteed interest rate of 7 percent. The employer is assumed to bear all the investment and longevity risk—highly unusual in public or private CB plans. However, the benefit accrual pattern is similar to a 401(k). That is, a compound annual interest rate of 7 percent was applied to contributions equal to 16.5 percent of salary. We assumed that the plan offered in-plan annuitization at 7 percent interest, on terms identical to the CalSTRS pension annuity. This is highly unusual among real world CB plans, which are almost always used as a means to facilitate risk-sharing between participants and employers.

Because DB plans express benefits in terms of income replacement (lifetime monthly income as a percentage of final pay), while DC plans and CB plans express benefits as lump sum account balances, we needed to create an apples-to-apples measure of retirement benefit value across these three plans. Given that the DC plan is the only plan in which there is an immediate cash value for individual participants, we converted the DB and CB plan benefits to 401(k)-equivalent values. For each year of separation, we identified the projected annuity benefit for the DB plan, and calculated the balance that would be required to fund the same benefit through the DC plan. We repeated the same procedure for the CB plan based on the assumed interest rate of 7 percent. In the cases where an employee contribution refund or lump sum cash-out in the DB plan had the greatest value, we simply used those cash values without adjustment. The same account balance will generate different income streams in a DC plan compared to the CB plan that we modeled, because the latter offers a higher interest rate on annuities.

Benefit Model Results

In order to simplify findings across entry ages and plan types, **Exhibit 7** provides a schematic illustration of benefit accumulation under the DC plan and the CalSTRS DB pension, and the share of current teachers that fall on each side of the crossover point between the two plans. (The CB plan in our model follows a similar accrual pattern to the DC plan, albeit with higher benefits due to the 7 percent in-plan annuity.) When benefit accrual patterns are considered in conjunction with projected tenure, we find that 85 percent of California teachers will receive higher retirement benefits from the CalSTRS DB pension than they would from an idealized DC plan, taking into account both retirement wealth and retirement income.

Under the CalSTRS pension, like most plans of its kind, teachers accumulate benefits more slowly than in a DC or CB plan in the beginning of their career. Pension accrual begins to accelerate mid-career so that the slope of the DB benefit curve becomes steeper than the slope of the DC benefit curve. Finally, after age 65—the age at which the CalSTRS pension benefit multiplier peaks—the growth of pension benefits as a multiple of current pay flattens out and in some cases becomes negative. Benefits continue to grow in absolute terms in tandem with salary growth and accumulated service years, but this is counterbalanced by the decrease in the number of years of benefit payments from delayed retirement.

Figure 7
Benefit Accumulation Under CalSTRS DB vs Idealized DC Plan

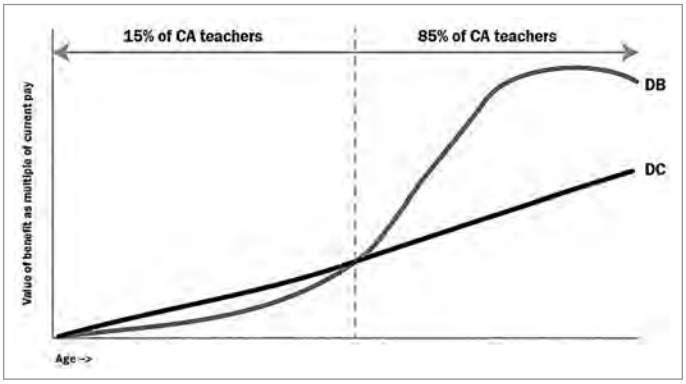


Figure 8 shows the age at which DB plan value exceeds the value of DC and CB plans for entry ages 25 to 45, in five-year increments. The comparison to the DC model has two sets of parameters: full normal cost versus just employee contributions, and idealized 401(k) returns versus a more realistic scenario in which typical individual behavior leads to 1 percent reduction of annual investment returns due to adverse investment behavior.

As expected for a back-loaded pension, it does take longer for younger workers to reach the break-even point compared to older workers. The CalSTRS DB pension becomes more valuable than the idealized DC plan at age 50 for teachers hired at age 25. This transition occurs at age 51 for those hired at age 30 and at age 50 for those hired at age 45. The CalSTRS DB pension becomes more valuable than the CB plan somewhat later—at age 57 for those hired at age 25, and at progressively younger ages for older hires.[10]

Figure 8 also shows that the addition of realistic individual investor behavior shortens the break-even horizon for the DB plan in relation to the DC plan, to age 47 for teachers hired at age 30. Realistic investor behavior also reduces the number of years to recover the full value of employee contributions vis-à-vis the DC plan to 11. Again, this assumes that teachers place no value on the guaranteed nature of DB pension benefits.

Figure 8
Age When Value of DB Plan Equals or Exceeds Value of Alternative Plans, by Entry Age

	Entry Age				
Comparison Plans	**25**	**30**	**35**	**40**	**45**
Idealzed DC Plan					
Full DC benefit	50	51	49	48	50
Value of employee contributions	41	42	41	45	50
DC Plan with Typical Investor Returns					
Full DC benefit	45	47	46	46	50
Value of employee contributions	36	38	40	45	50
CB Plan with Guranteed Equal to DB Expected Return	57	55	55	53	54

Note: Idealized DC plan assumes no investor mistakes. Realistic DC plan assumes 1% drag on returns from typical investor behavior. However, all plans assume consistent funding and no leakage. Difference between DB and CB value at age 56 was trivial, .06%.

While it does take a significant period of time for new hire teachers to accrue benefits under the CalSTRS DB pension that exceed the benefits they might have accumulated under an idealized DC plan, CalSTRS comes out ahead for a significant share of new hire teachers. **Figure 9** shows the share of new hires that will earn greater benefits under the DB pension than alternative plans, by sample entry ages and for all new hires combined. It includes an estimated share of all new hires who will accumulate greater benefits under the CalSTRS pension than the alternative plans, calculated by weighting the percentage of each entry group projected to stay until the benefit crossover points by its share of the new hire population in FY 2014. Notably, half of new hires (50 percent) are better off with the DB pension than a 401(k)-type plan—again, without fully accounting for the value of the pension guarantee. This contradicts the assertion that new teachers are unequivocally better off with a DC plan.

85 percent of teachers will earn greater retirement benefits from the CalSTRS DB pension than they could expect from DC.

We found that 45 percent of new hires are better off with the CalSTRS pension than a CB plan that guarantees 7 percent. However, it is unlikely that states would offer this level of guarantee for a new CB plan for public employees. Such a plan would impose the same liability on public employers as a traditional DB plan, while sacrificing retention incentives and potentially increasing turnover costs.

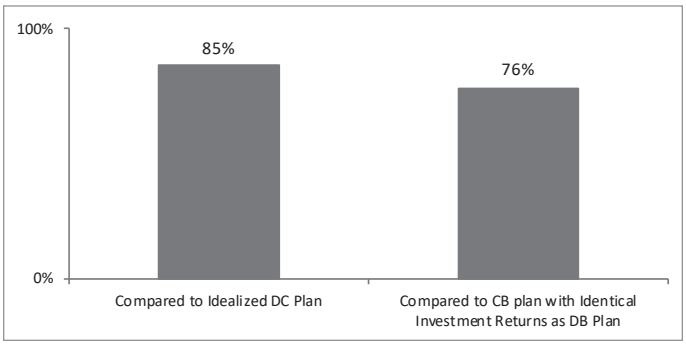
Figure 9
Share of New Hire Cohort for Whom Value of DB Pension Will Equal or Exceed Alternative Plans

	Entry Age					Weighted Average for All New Hires
	25	**30**	**35**	**40**	**45**	
Idealzed DC Plan	47%	51%	52%	58%	64%	**50%**
CB Plan	40%	46%	48%	52%	56%	**45%**

Note: Authors' analysis of FY 2014 membership microdata based on current actuarial assumptions.

Finally, in order to estimate the share of the California teaching workforce that is better off with a DB pension, we applied the highest age thresholds when the DB value exceeds the value of alternate plans (age 50 for DC and age 57 for CB) to the projected age-service distribution. Ultimately, 85 percent of active teachers will vest and stay long enough to earn greater retirement benefits from the CalSTRS DB pension than they could expect from an ideal DC plan (**Figure 10**). Similarly, 76 percent of active teachers are better off with the CalSTRS pension than with a generous CB plan that offers a guaranteed interest rate equal to the CalSTRS pension expected return.

Figure 10
Share of California Teachers Who Are Better Off With CalSTRS DB Pension Compared to Alternative Plans



Note: Authors' analysis based on CalSTRS active membership data and actuarial assumptions as of June 30, 2016.

CONCLUSION

Contrary to studies of retirement benefits based on new-hire cohorts that claim that most teachers do not benefit from a traditional pension, our analysis clearly shows that most teachers working in the profession can expect long careers, and are thus well-positioned to benefit from a traditional pension. Conversely, replacing DB pensions with DC or CB plans would reduce the retirement incomes of a large majority of teachers.

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ENDNOTES

1 McGee, J. and M. Winters, "Better Pay, Fairer Pensions: Reforming Teacher Compensation." Manhattan Institute, 2013; McGee, J. and M. A. Winters. "Modernizing Teacher Pensions." *National Review*, No. 22 (2015); Aldeman, C. and A.J. Rotherham. "Friends without Benefits: How States Systematically Shortchange Teachers' Retirement and Threaten Their Retirement Security." Bellwether Education Partners, 2014; Johnson, R.W. and B. Southgate, "Are California Teacher Pensions Distributed Fairly?" Urban Institute, April 2015; Aldeman, C. and R. Johnson, "Negative Returns: How State Pensions Shortchange Teachers," Urban Institute, September 2015; Costrell, R. M. and J. McGee, "Cross-Subsidization of Teacher Pension Normal Cost: The Case of CalSTRS," University of Arkansas, EDRE Working Paper 2016-2017, October 2016; Luecken, M., "(No) Money in the Bank: Which Retirement Systems Penalize New Teachers?." University of Arkansas Thomas B. Fordham Institute, 2017.

2 Aldeman and Johnston (2015), op cit.

3 Morrissey, M., "Teachers and Schools are Well Served by Teacher Pensions," Economic Policy Institute, October 2017.

4 The results of this study were originally published in Nari Rhee and William B. Fornia, , "How do California Teachers Fare under CalSTRS? Applying workforce Tenure Analysis and Counterfactual Benefit Modeling to Retirement Benefit Evaluation," Journal of Retirement, Fall 2017. An earlier version of this study, based on 2014 data, was published as Nari Rhee and Flick Fornia, "Are California Teachers Better off with a Pension or 401(k)?," UC Berkeley Center for Labor Research and Education, February 2016.

5 Grouped totals may not add up due to rounding.

6 Normal cost for the CalSTRS DB pension, exclusive of death and disability benefits was provided by David Lamoreux, CalSTRS actuary, via email, April 17, 2017.

7 The only change in the capital market assumptions between FY 2014 and FY 2016 was a .25 percent reduction in the inflation assumption, and CalSTRS chose to reduce its discount rate by .50 percent as a measure of conservatism. For this study, we decreased the TDF portfolio annual returns by .25 percent to reflect the inflation decrease.

8 For an overview of research on individual investor behavior and underperformance, see Barber Odean (2011) and Tang, Mitchell, and Utkus (2011).

9 If an individual were to forgo the annuity, they would still have to pace their annual withdrawals to last well past average life expectancy, or else run a large risk of running out of money.

10 Comparing our current findings to our 2016 study of CalSTRS (Rhee and Fornia 2016), and looking across entry ages, the crossover points at which the CalSTRS pension benefit equals or exceeds alternative benefits have not significantly shifted as the result of the new actuarial and investment return assumptions. The reason is that, while our model shrank the gap in investment returns between the DB pension and alternative plans, and increased contributions to the alternative plans on par with the new normal cost for CalSTRS, this was offset by salary growth changes and increased life expectancy.

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Social Security Coverage for Employees of State and Local Governments

By Bruce D. Schobel

In 2018, nearly all employees of private corporations in the United States, as well as U.S. nationals working for U.S. employers and certain subsidiaries of U.S. employers outside the U.S., are *mandatorily* covered by the U.S. Social Security program. In the vast majority of cases, neither the employees nor their employers have any choice in the matter. The law requires that they participate in the program and pay the mandatory payroll taxes. (Eligible employees are not required to apply for benefits, but nearly all do!) Mandatory Social Security coverage is also imposed on nearly all self-employed individuals who file U.S. income-tax returns and on Federal Government employees hired since Jan. 1, 1984.

Employees of state and local governments are different and follow their own special rules. Because of constitutional limitations on the Federal Government's ability to tax states (as employers, in the case of Social Security coverage), employees of state and local governments can be covered by Social Security in only two ways:

1. Mandatorily, for employees working in positions that are *not* covered by an employer-sponsored retirement plan considered to be "comparable" (as defined by IRS regulations) to the Social Security program, or

2. Voluntarily, for employees working in positions that are covered by a "comparable" employer-sponsored retirement plan.

Voluntary coverage of any state or local governmental employee group is effectuated by the group's employer, working through the appropriate state's Social Security Administrator, entering into an agreement with the Social Security Administration (SSA). These agreements became possible under the terms of Social Security Act section 218, which was first enacted into law back in 1950 and has been amended from time to time. Before 1950, state and local government employees simply could not be covered by Social Security.

Section 218 requires the employer desiring Social Security coverage for its employees to conduct a referendum among

employees in positions that would become covered by the proposed voluntary coverage agreement. If a majority of the employees vote in favor of being covered by Social Security, then the voluntary agreement goes into effect. In such cases, state and local governmental employees working in covered positions—and their employers—pay the same Social Security taxes as do private-sector employees and their employers. The employees become eligible to receive the same Social Security benefits under the same eligibility conditions as apply to private-sector employees.

In most states, the required referenda are all-or-nothing. In other words, if the affected employees vote yes, then all of them are covered, along with newly hired employees. But in 23 states listed in Social Security Act section 218(d)(6)(C), governmental employers can create so-called divided retirement systems. In those cases, coverage occurs only if a majority of affected employees votes yes, but the positions of employees who voted no can continue to be excluded from Social Security coverage. If a majority of existing employees vote yes in such a referendum, thereby approving it, then all **newly hired** employees are also covered by Social Security going forward.

At the current time, slightly more than 20 million people are employed by state and local governments across the U.S. Almost three-fourths of those employees are covered by Social Security, mostly under section 218 voluntary coverage agreements. The rest, about 5 to 6 million workers, do not have Social Security coverage in their current government jobs. Obviously, and importantly, many (even most) of these noncovered employees may have been or will be covered by Social Security in their previous, subsequent or even simultaneous other jobs, whether in the private sector or the public sector. Few people work their entire careers in noncovered employment.

The Social Security Act provides special benefit formulas for people receiving pensions based in whole, or in part, on employment that was not covered by Social Security. Fundamentally, the reasoning behind these special formulas is that people with employment histories split between covered and noncovered employment appear to the SSA (and to the Social Security program itself) to be poorer than they really are. In the absence of special rules, these not-really-poor people would be able to receive certain subsidies intended to go to lower-income workers and their families. The special formulas apply only to retirees **receiving pensions** based on noncovered employment because receipt of a pension represents a sort of threshold for determining whether the noncovered employment was substantial or not. People who worked for just a short time in noncovered employment generally have their benefits computed using the regular benefit formulas, without any adjustments.

The two special benefit formulas are as follows:

1. The government pension offset, or GPO, was first enacted into law in 1977 and significantly amended in 1983. That formula often prevents government retirees from receiving Social Security benefits as spouses or widow(er)s. The GPO does not affect the worker's **own** benefit (i.e., based on his or her own earnings record), just certain auxiliary benefits that the worker might otherwise be able to receive on a spouse's or former spouse's earnings record.

2. The windfall elimination provision, or WEP, was enacted into law in 1983 and provides a special benefit-computation formula for retired-worker benefits. The special formula removes some of the weighting in Social Security's usual benefit formula that gives higher replacement rates to low-income retirees. Most governmental retirees get much less of that weighting. The WEP, unlike the GPO, affects the worker's own benefit. Interestingly, the WEP does not affect the computation of benefits payable to the widow(er) of a worker whose benefit was computed using the WEP formula. After the worker's death, the WEP ceases to apply. Note that workers receiving governmental pensions that would normally trigger the WEP may be exempt if they have substantial enough covered employment.

This article has merely introduced, or scratched the surface, of some of the complex issues involved in providing Social Security coverage to employees of state and local governments and in computing the Social Security benefits of those who were not covered. These subjects will be covered in more detail in a series of articles planned for the next several issues of this newsletter. I hope that you look forward to learning more about this interesting subject.

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Why Risk-free is Not the Place to Be!

By Brent A. Banister

The American Legislative Exchange Council (ALEC) in its December 2017 publication, *Unaccountable and Unaffordable*, frequently cites a risk-free rate as being the measure they believe should be used to value pension liabilities. Their specific choice of the risk-free asset is a synthetic 15-year Treasury bond.

Certainly the idea of something being "risk-free" is appealing, but what is not carefully discussed is what risks this bond actually avoids. Treasuries are generally considered risk-free because it is confidently assumed that the United States Treasury will not fail to pay the bond principal and interest when due. While default risk is eliminated, there is no elimination of market risk: A Treasury bond could be worth less next year than it is today if interest rates increase. While the Treasury bond should never have a value of $0, the owner of the bond may still lose money on the value of the bond. The bond is risk-free only to the extent the promised nominal payment will be made at maturity (and coupon dates, if applicable), but it may not be as valuable either as a marketable asset or in exchange for goods and services at some point in the future as it is now. Thus, ALEC's desire for seemingly eliminating investment risk may not be accomplished through the use of Treasuries.

Theoretically, a portfolio of Treasuries could be constructed that would match the expected cash needs of a retirement fund—at least for the next 30 years (the term of the longest Treasury bonds). By holding these bonds to maturity, investment risk is indeed eliminated—the value of the bond at any point in time before it matures will be of no consequence. Mortality risk, of course, is not eliminated, but in a large pool of people it is at least mitigated. However, the cost of assembling such a portfolio is significantly higher than the cost of a portfolio that accepts some risk, but should, on average, meet the future needs. Because of the risk, it may be necessary to add additional funds along the way (the expected return is not met), or it may be possible to remove or reallocate funds (the expected return is exceeded). If an individual, an employer, or a retirement system is willing to take the risk of adjusting in the future, it can fund the desired benefit for a lower cost. In other words, those funding the future needs benefit (on average) from taking the risk.

ALEC looks at the difference in the liabilities calculated with the risk-free rate and the expected-return rate and portrays this as somehow understating the liability. As a different perspective noted in the American Academy of Actuaries Issue Brief *Measuring Pension Obligations* (November 2013), this difference can be considered the price of certainty in the investments. Alternatively, this can be thought of as the amount expected to be saved by taking on some risk. Prudent investors (as the trustees of these retirement systems are required to be) would be expected to take on manageable risk and reap the corresponding rewards. Consequently, this difference can be considered as the savings that should then be available to the tax-payers (as the employer) and/or the contributing employees over time.

ALEC makes note of the way in which CalPERS uses one discount rate (7.5 percent) for setting costs for on-going employers, while using a lower rate (3.8 percent) for employers withdrawing from the system. They suggest that this is inconsistent on the part of CalPERS. Based on the considerations of the need for certainty, however, this practice makes sense—once an employer withdraws from the fund, they are no longer sharing in the risk, and so they need to "purchase" the elimination of risk. Essentially, they are being required to buy an insurance policy against the possibility of a low return. Of course, if the long-term future returns exceed the 7.5 percent expectation, this insurance was not needed and the premium serves to benefit the remaining employers.

In the pension realm, risk considerations are very important. It should be abundantly clear that providing a source of income for an individual's lifetime is a task with significant potential for variation—if for no other reason than the wide range in life span experienced by individuals. In addition to this longevity risk, there is investment risk that comes as part of the accumulation and then drawdown of assets to fund the retirement. The downside risk—an elderly retiree with no income to live on—is very undesirable, while the apparent upside risk—significant assets left to an heir—represents funds that potentially could have been spent at some other stage in life, but were instead set aside.

It has become popular for critics of pension funds to complain about the risk they take. However, the risk is a price that is paid for better returns. Consider the following quote by Warren Buffet in his 2017 shareholder letter:

> Investing is an activity in which consumption today is forgone in an attempt to allow greater consumption at a later date. "Risk" is the possibility that this objective won't be attained. . . .

I want to quickly acknowledge that in any upcoming day, week or even year, stocks will be riskier—far riskier—than short-term U.S. bonds. As an investor's investment horizon lengthens, however, a diversified portfolio of U.S. equities becomes progressively less risky than bonds, assuming that the stocks are purchased at a sensible multiple of earnings relative to then-prevailing interest rates.

It is a terrible mistake for investors with long-term horizons—among them, pension funds, college endowments and savings-minded individuals—to measure their investment "risk" by their portfolio's ratio of bonds to stocks. Often, high-grade bonds in an investment portfolio increase its risk.

Risk is not an inherently negative concept. Risk is a reality in a world with unknowns. When risk can be reduced through pooling (as in insurance), there can be significant reduction in net risk to those involved. When risk can be taken on through investments, a target level of funds can, on average, be acquired for a lower cost. If we decide to avoid risk at all costs, we end up with a situation where each worker must save (by stuffing money in a mattress to avoid investment loss) enough money to pay for expenses through age 110 or 120. Quick back-of-the-envelope calculations would indicate that this means a worker starting at age 25 must save over half his or her income through a 45-year career to age 70 to have sufficient funds to live through age 115 (assuming no inflation—a risk factor that would add even more cost). However, a group of people pooling their funds to reduce mortality risk and invest in a diverse portfolio can provide the same retirement security at a much lower cost and earlier retirement age. Risk should be welcomed, not feared.

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Measuring Public Pension Liabilities: A Discussion in Response to ALEC's "Unaccountable and Unaffordable"

By Paul Angelo and Douglas Fiddler

Anyone familiar with the operation of public pension plans in the U.S. is likely aware of the ongoing controversies as to how to measure the unfunded liabilities of such plans. Most of the discussion centers on the "discount rate" used to determine the present values on which those actuarial liabilities are based. One common source of confusion in this important policy discussion is that there are actually two different controversies.

First, there are two very different ways to select the discount rate, one based on the expected investment return on plan assets, and one based on current market yields on fixed income securities. The "expected cost" approach is used by most actuaries advising U.S. public pension plans on ongoing funding, and depends critically on the asset allocation of the plan assets. The "market pricing" approach is advocated by financial economists and is independent of how plan assets are invested.[1]

The second area of discussion is, for plans that base their discount on expected returns, are those expected return assumptions too high, and should they be reduced to what some consider more realistic levels.

These are both legitimate areas for both disagreement and productive discussion. The first issue, the so-called "MVL debate," is now about 10 years old and has been thoroughly discussed by the Governmental Accounting Standards Board (GASB) and the Actuarial Standards Board (ASB).[2,3] Regarding the second discussion, public pension plans across the U.S. are reviewing and reducing the expected returns they use as their discount rates.[4]

However, it is essential to keep in mind that these are two very different issues that both involve the same valuation parameter: the discount rate. Specifically, if a critic of current public pension practice says that a plan should lower its discount rate, this should immediately invite the question: Why? Is it because the critic thinks the plan should abandon the expected cost approach (discount rate based on *assumed* or expected return on assets) and instead adopt the market pricing approach (discount rate based on *observed* bond yields)? Or is the critic willing to continue using an expected return discount rate, but arguing that the expected return should be substantially lower (say, 6.5 percent instead of 7.5 percent)?

These very different arguments require different justifications and are subject to different responses. For example, as noted above under the expected cost approach the discount rate is an actuarial **assumption,** based on plan assets while under the market pricing approach it is a market **observation,** independent of plan assets. Thus, the "MVL debate" is over which of these two entirely different types of measures is appropriate for public sector pension plans, whether as the basis for funding or only as an additional disclosure.

In contrast, discussions of expected return are about more or less conservative values for the same type of measure.

Unfortunately, some critics conflate these two different arguments for a lower discount rate in a way that is at best confusing and at worst deceptive. A notable example of this sort of approach is the December 2017 publication by the American Legislative Exchange Council (ALEC) titled "Unaccountable and Unaffordable." ALEC so confuses the two different types of discount rates as to reach conclusions that are inconsistent with both the expected cost approach and the market pricing approach.

THE "RISK-FREE RATE"

Understanding discount rates is an admittedly technical issue where careful use of terminology can be essential to avoid confusion. Conversely, misuse of terminology can make weakly argued positions sound convincing. In discussing discount rates, by far the most misunderstood and misused term is the so-called "risk-free rate."

In financial economics, the theoretical market discount rate for any stream of payments is developed as follows. You assemble a "reference" bond portfolio that has the same cash flows *and the same default risk* as the payment stream you want to value. Then the market discount rate is the yield rate on that portfolio, as determined by its current market price. The key here is that the

market discount rate depends critically on the default risk of the payment stream being valued. If there is a high default risk then your reference portfolio might include some lower credit quality junk bonds with very high yield rates. However, if the payment stream is a public sector pension, the default risk, i.e., the chance that the benefits will not be paid, is generally considered so low as to be practically zero. That means the theoretical reference portfolio will include only bonds of similarly low default risk, i.e., U.S. Treasuries with very low yield rates.

So the financial economists' risk-free rate really means a "default-risk-free rate," the rate the market would use to price a stream of payments with no default risk. The confusion comes when this term is used in a discussion of investment risk. In that context, a reader might think that "risk-free" means free of investment risk, so that using a risk-free discount rate (with a plan invested in reasonably risky assets) will eliminate the investment risk of not earning the discount rate. It won't. The only way to do that would be to actually invest plan assets in the no-risk reference portfolio, which of course is an asset allocation decision, not a plan valuation decision.

Throughout their report, ALEC refers to the (default-) risk-free discount rate favored by financial economists as the "estimated risk-free rate of return." They then use that mischaracterization of the *market pricing discount rate* to argue for its use as the *expected return* even if the plan is not invested solely in risk-free assets. By blurring the distinction between discount rate and expected return, the report makes fallacious arguments for lower expected returns, including the use of the spurious concept of a "risk-free expected return."

The conflation of the discount rate and investment return concepts is most clearly seen in the definition of discount rate found in the report's glossary:

> **Discount rate—**An investment return, expressed as a percentage, that the retirement plan's managers hope to achieve. It may be tied to the yield of U.S. Treasury bills, a stock market index or other measure.

This definition starts by saying that the discount rate is the expected ("hope to achieve") investment return on plan assets. It then says that investment return may be tied to a risk-free rate like US Treasury yields. This is false and misleading. If the discount rate is tied to U.S. Treasury yields then it is not based on the expected investment return. In other words, there is no risk-free expected return. If a plan uses U.S. Treasury yields as its discount rate that does *not* mean it is assuming a low expected investment return. It means it is setting its discount in a manner *unrelated* to its expected investment returns.

In effect, based on this faulty definition, the ALEC report is using the debate over which type of discount rate to use as an argument for lower expected returns. The central issue in the ongoing "MVL debate" is whether the discount rate should reflect the expected investment return on the fund's assets *or* reflect the current market yield of a security with a similar default risk as the projected benefit. In that debate, the market pricing proponents are not arguing that a balanced portfolio of stocks and bonds should be expected to earn the risk-free rate. And yet that is the entire basis of the ALEC report.[5]

Having muddled over a decade of serious professional debate by redefining key actuarial terminology in a manner inconsistent with both common technical usage and current actuarial standards, the report repeatedly claims that the yield on its synthetic Treasury bond represents "more reasonable long-term market performance expectations," "more realistic investment return assumptions," and "a more realistic estimate of each state's funding ratio," which "would protect taxpayers from having to bail out pension plans." Further extending this argument, the report accuses states of "flawed reporting," "faulty accounting," "work(ing) around these (accounting) requirements," and "overt mismanagement." This unwarranted criticism is based entirely on its misleading redefinition of key terminology and methodology in current actuarial and accounting standards set by the Actuarial Standards Board and the Governmental Accounting Standards Board.

The attached appendix presents a more complete list of errors and misstatements in the ALEC report.

APPENDIX—ERRORS AND MISSTATEMENTS IN THE ALEC REPORT

DISCOUNT RATE VS. ASSUMED INVESTMENT RETURN

As discussed, the report defines the discount rate to be equal to the assumed investment return and argues a synthetic Treasury yield is a reasonable assumed investment return. In contrast, the Actuarial Standards of Practice reflect the fact that the discount rate may be set equal to an assumed investment return, a rate approximated by market yields of a bond portfolio, or some other measure. Other than its faulty definition the ALEC report presents no arguments that the report's synthetic Treasury yield is a reasonable assumed investment return. The following misstatements are a result of the report's confusion between discount rate and assumed investment return:

P2 ¶2: "... alternative measures more consistent with prudent risk management and more reasonable long-term market performance expectations. This report clearly illuminates the pervasive pension underfunding across the nation and details the assumptions and trends contributing to this crisis."

P3 ¶1: "If net pension assets are determined using more realistic investment return assumptions, pension funding gaps are much wider than even the large sums reported in state financial documents."

P4, ¶3: "The Center for State Fiscal Reform at ALEC analyzes the annual official financial documents of more than 280 state-administered pension plans using more realistic investment return assumptions in order to gain a clearer picture of the pension problem. ... This year's study uses a risk-free rate of 2.142 percent, derived from an average of the 10- and 20-year U.S. Treasury bond yields over the course of 12 months spanning April 2016 to March 2017."

P4, ¶6: "Applying the estimated risk-free rate of return to the actuarial assets and actuarial liabilities reported by pension plans generates a more realistic estimate of each state's funding ratio."

P11, ¶5: "The public sector estimates of future returns are woefully delayed in responding to market reality. While 46 percent of pension funds reduced their discount rates to reflect poorer-than-expected returns over the past two decades, their reaction is too little too late. Even the lower rates adopted in 2016 are well above the risk-free rate that would protect taxpayers from having to bail out pension plans."

P16 ¶3: "Unlike GASB-directed CAFRs and Actuarial Valuation Reports, ALEC uses a more realistic valuation to determine the unfunded liabilities of public pension plans. ... ALEC uses a more prudent rate of return, based on the equivalent of a hypothetical 15-year U.S. Treasury bond yield. Since this is not presently offered as an investment instrument, the number is derived from an average of the 10- and 20-year bond yields. This year's number is averaged from the 12 months spanning April 2016 to March 2017. The resulting rate is 2.142 percent, a reduction of 0.202 percent compared to last year."

P24, ¶7 "**Discount rate**—An investment return, expressed as a percentage, that the retirement plan's managers hope to achieve. It may be tied to the yield of U.S. Treasury bills, a stock market index or other measure."

STATES' REPORTING OF LIABILITIES IS FLAWED

Based on the conflated concepts of discount rate and investment returns, the report accuses states and public plans of flawed reporting and accounting practices when, in fact, states and plans are adhering to the standards promulgated by the Actuarial Standards Board and the Governmental Accounting Standards Board.

P2, ¶5: "... this report presents a more comprehensive picture of the problem, which is often obscured by the states' flawed reporting of liabilities."

P3, ¶4: "Faulty accounting and reporting methods obscure the magnitude of unfunded liabilities."

P3, ¶5: "Unfortunately, states have found ways to work around these (GASB) requirements. ..."

P11, ¶1: "The current pension crisis stems from overt mismanagement, failures to meet the actuarially required contribution, and subtle mismanagement, such as outdated mortality tables and unrealistic actuarial assumptions."

PENSION PROTECTION ACT

The ALEC report compares the funding regulations applicable to private sector plans under the Pension Protection Act (PPA), but ignores that (1) private sector plan funding is based on a different funding method and (2) the rates applicable to private sector plan funding under PPA have been granted relief because of historically low fixed-income rates since they became effective. The discussions imply that private sector plan funding is based on risk-free rates when they are based on high-quality

corporate bond yields that produce higher rates than the ALEC report is advocating for use by public sector plans. In addition, the private sector discussion reflects the report's confusion between the concepts of discount rate and assumed investment return.

P5, ¶2: "If the Pension Protection Act were applied to the public sector, every single state would be considered at risk of defaulting on their pension obligations assuming a risk-free rate of return."

P11, ¶1: "Federal regulators require private sector pension managers to use a discount rate of approximately 4.5 percent, but turn a blind eye to the 7 or 8 percent assumed rates used by public sector managers."

P11, ¶3: "As a result, private sector pension funds usually have more conservative assumed rates of return, which increase their annual required contributions and diminish the risk of insolvency."

INVESTMENT RETURN ASSUMPTION SETTING

The ALEC report states public sector assumed investment returns are based on historical rates whereas they are required to be estimates of future experience (that may consider historical data) or observations of estimates in market data. The report also quotes the Society of Actuaries Blue Ribbon Panel as supporting a risk-free rate of return assumption, using a quote that only supports such a rate if the second part of the quote is ignored.

P11, ¶3: "Generally, private sector pensions must base theirs (discount rates) on trends in the bond market whereas public sector pensions use their historic rates of return."

P11, ¶5: "... 46 percent of pension funds reduced their discount rates to reflect poorer-than-expected returns over the past two decades. ..."

P16, ¶4 "As the Society of Actuaries' Blue Ribbon Panel on Public Pension Plan Funding recommends, 'the rate of return assumption should be based primarily on the current risk-free rate **plus explicit risk premium** or on other similar forward-looking techniques.' " [emphasis added]

P24, ¶7 "**Discount rate**—An investment return, expressed as a percentage, that the retirement plan's managers hope to achieve. It may be tied to the yield of U.S. Treasury bills, a stock market index or other measure."

CONCLUSION

The actuarial and accounting standards applicable to pension plan funding are re-evaluated and revised as necessary to provide accurate and complete information to stakeholders. Public pension plans and the actuaries consulting to them strive to adhere to both the letter and the spirit of those standards. The ALEC report authors' approach of redefining the terms used in these standards loses the clarity and precision needed for a robust professional debate on this important but technical issue. Specifically, for plans invested in reasonably risky assets, basing their argument for lower expected returns on an ill-defined and unavailable risk-free rate of return serves only to provide inaccurate but controversial talking points. State and local governments, public pension plans, government employees and the public deserve better information than the faulty conclusions based on misleading terminology found in the ALEC report.

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ENDNOTES

1 For further discussion of the "expected cost" versus "market pricing" approaches to discount rate selection, including recent developments in both actuarial and accounting standards, see "Understanding the Valuation of Public Pension Liabilities, In the Public Interest" (Newsletter of the Society of Actuaries' Social Insurance & Public Finance Section), Jan. 12, 2016. *https://www.soa.org/Library/Newsletters/In-Public-Interest/2016/january/ipi-2016-iss12.pdf*.

2 The ongoing debate between (most) financial economists and public pension actuaries involves not only the type of discount rate but also the "cost method." Financial economists use an "accrued benefit" method based on benefits for current service and salary. Public pension actuaries use a "level cost" method based on an allocation of the expected cost of projected benefit, based on service and salary at retirement. The ALEC report does not address the use of different cost methods, so we will not either. See the reference in note 1 for more details.

3 The Actuarial Standards of Practice (ASOPs) state clearly that "the purpose of the measurement [is] a primary factor in selecting a discount rate." Examples of such purposes include funding, financial disclosure, settlement, and market valuation. See ASOP No. 27, Section 3.9 (ASB Doc. No. 172, September 2013). Similarly, ASOP N0. 4 emphasizes the purpose of the measurement when selecting the cost method described in note 2.

4 See for example the February 2018 Issue Brief on "Public Pension Plan Investment Return Assumptions" at Issue Briefs & Analysis @NASRA.org. *https://www.nasra.org/files/Issue%20Briefs/NASRAInvReturnAssumptBrief.pdf*.

5 The report's definition of discount rate also directly conflicts with ASOP 27 which, as noted earlier, states that the selection of the discount rate should consider the purpose of the measurement. In that context, the ASOP clearly distinguishes a discount rate based on "anticipated investment return" from discount rates "approximated by market yields for a hypothetical bond portfolio."

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