



Treasury Notes

October 29, 2015



Retirement Plan Primer

DEFINED BENEFIT PLANS (SERS and PSERS)

- ▶ Benefit levels set based on employee's salary and years of service.
- ▶ Funded by contributions by the employer and employee.
- ▶ Contributions pooled across plans' participants and invested by professional money managers.
- ▶ Benefits are paid throughout retirement regardless of how long an employee lives.
- ▶ Benefits are relatively predictable, allowing employees to easily plan for retirement.
- ▶ According to the U.S. Department of Labor the number of defined benefit plans has dropped from 103,346 in 1975 to 46,601 in 2012.

DEFINED CONTRIBUTION PLANS (401(k) or 403(b) plans)

- ▶ Employee owns the retirement account and chooses what rate to contribute.
- ▶ Employer often contributes a fixed percentage of employee's salary at regular intervals.
- ▶ Investment choices are directed by employee across a portfolio of options.
- ▶ Retirement benefits are determined by contributions and investment earnings.
- ▶ Accounts are portable and employees maintain ownership if they change jobs. Accounts may be accessed prior to retirement under limited circumstances.
- ▶ Since 1975 defined contribution plans grew from 207,748 to 633,0221 in 2012.

CURRENT CHALLENGES

- ▶ To meet promised payments in a defined benefit plan, employers must fund plans at their expected contribution level. For a number of reasons, some existing plans have actuarial shortfalls that may make that difficult to achieve. Forgoing employer contributions at expected levels could result in reduced benefit payments, increased employee contribution levels, and/or reliance upon overly optimistic investment rates of return.
- ▶ In a defined contribution plan, employees often don't fund their plans at a high enough level, make poor investment choices or pull money from the plan for non-retirement items. As a result, plans are not funded adequately to meet expected level of retirement income or to last through retirement.
- ▶ Both plans rely on investments growing. If returns fail to meet expected rates for a prolonged period, the value of the plan will fall short, jeopardizing the benefits of future retirees.



A Message from Timothy A. Reese

Few fiscal issues will more profoundly affect the economy of the Commonwealth than how we address the current shortfalls facing our statewide public pensions. These plans represent a promised income stream for public employees who have contributed toward their retirement security throughout their careers. State policy makers continue to struggle with ensuring these plans provide promised benefit levels while also reducing the taxpayers' costs of offering a retirement plan.

Timothy A. Reese

Timothy A. Reese
Pennsylvania State Treasurer

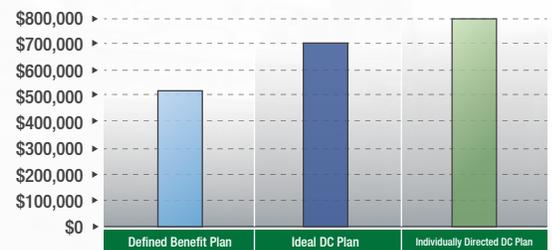
This issue of *Treasury Notes* continues the analysis featured in the [last issue](#), which reviewed basic pension fund concepts and identified possible causes for current actuarial deficits at the State Employees' Retirement System (SERS) and Public School Employees' Retirement System (PSERS). Elements of both defined benefit plans and defined contribution plans are examined, including a comparison of the costs and returns of both types of plans, the impact of shutting down a defined benefit plan, and the size of pensions Pennsylvania public employees receive. Rather than advocating for any particular type of plan, the intent is to highlight certain aspects of these plans that may have escaped attention.

Comparing Costs and Returns

Costs

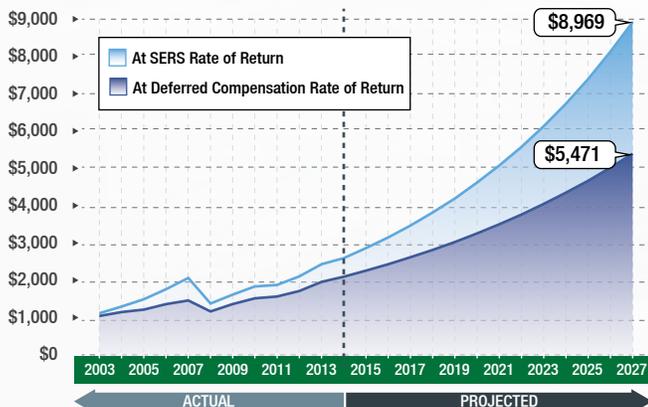
The chart to the right illustrates the disparities in the amount needed at retirement to ensure a retirement benefit of \$2,700 per month under a defined benefit plan, an ideal (low fee) defined contribution plan, and an individually directed defined contribution plan. According to the National Institute on Retirement Security, a key reason for the lower amount required by the defined benefit plan (beyond lower fees and increased portfolio diversification) is that the structure of the defined benefit plan allows invested income to continue to grow during retirement, which may last several decades. The defined contribution plan also continues to generate a return during retirement, but at a lower rate given the need to prioritize principal protection over investment returns – and avoid volatility – during retirement.

- Amount Needed to Retire -



Source: National Institute on Retirement Security
Note: Ideal DC plan is characterized by low fees.

- Growth of \$1,000 -



Source: SERS, Pennsylvania Treasury

Returns

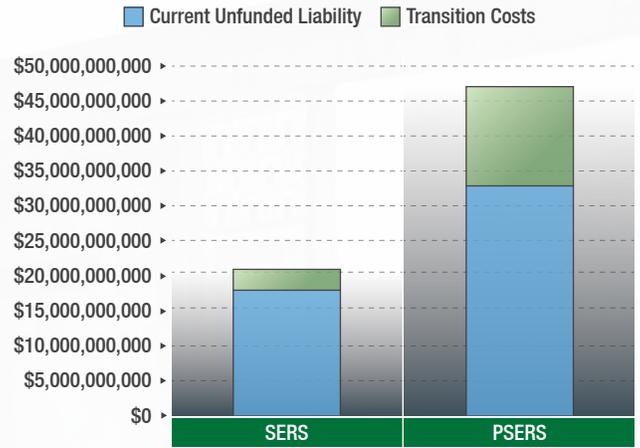
The chart to the left tracks \$1,000 invested in 2003 in SERS versus an equal amount invested in Pennsylvania's Deferred Compensation program (which serves here as a proxy for defined contribution plans). If this performance differential continued for an additional 14 years (for a total investment period of 25 years), the same starting investment would be worth 64% more using SERS' historic performance than it would with the Deferred Compensation Program's performance. Assuming the same respective investment results, a defined contribution plan hoping to accumulate a retirement balance of \$100,000 over this 25-year period would need a starting deposit of \$18,278 while a defined benefit plan would need a starting deposit of only \$11,150. Regardless of the value of the investment benefit an employer desires to provide, a defined benefit plan is a less costly way (for both employer and employee) to accumulate the necessary balance because of intrinsic investment disadvantages that hold back defined contribution plan investment performance.

Closing a Defined Benefit Plan

One advantage of a defined benefit plan is its ability to invest over a much longer time horizon than any individual investor-based plan could, in part, because of the continuing addition of new members to the plan. However, this advantage would disappear if the defined benefit plan were “closed” to new employees. With all new employees entered in a defined contribution plan, the legacy defined benefit plan must shorten its investment horizon to maintain the required liquidity to pay the remaining members’ benefits. Consequently, the plan will likely see returns fall below those previously expected as it is compelled to reallocate its assets into more liquid investments.

In 2013, independent actuaries analyzed former Governor Corbett’s pension reform plan to end the state’s defined benefit pension plans and create a defined contribution plan for all new employees. According to these analyses, the transition costs of closing down SERS and PSERS for new employees will actually add approximately \$17 billion in liabilities (on a discounted basis) to the two systems by reducing the investment returns that the funds would earn as they are forced to shift to more liquid investments to compensate for the loss of new member contributions. The graph to the right shows that these additional costs were projected to equal one-third of the plans’ current unfunded liabilities.

Transition Costs Associated with Closing Defined Benefit Plans



Source: SERS, PSERS, Pennsylvania Treasury

Actuarial Assumptions

	Actuarial Value of Benefits	Net Reduction in Liability	Liability Reduction as Percentage
Current Policy	\$396,189.45		
2% Multiplier for Future Years	\$348,646.72	\$47,542.73	13.64%
1% Reduction in Wage Assumption	\$335,234.16	\$44,093.27	13.15%

Source: Public Employee Retirement Commission (PERC), Pennsylvania Treasury

The unfunded liability of the pension systems is based on a number of factors. Some are directly related to the benefits awarded to employees, such as the multiplier (the rate at which employees accrue pension benefits for each additional year of service). Other factors include actuarial assumptions that determine, in aggregate, the projected liabilities of the system. These assumptions include factors like the rate of return on investments, the life span of retirees, and the rate of salary growth over the lifetime of an employee.

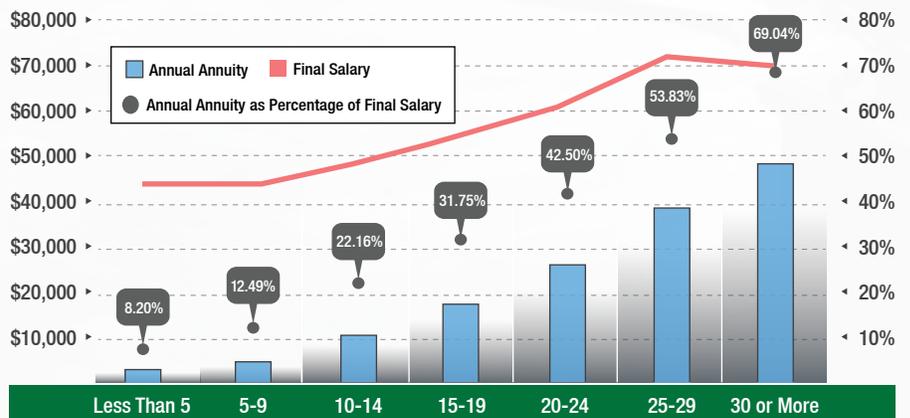
Modifications to any of these factors can greatly change the actuarial liability of a pension system. The table here illustrates how some modifications could reduce the liability associated with an average SERS member. Currently, pension benefits accrue at a rate of 2.5% for each year of service for employees hired prior to Act 120 of 2010. While the legality of reducing the rate has been challenged, if it was decreased to 2.0% for years of service not yet worked, the table shows that SERS’ liability for an illustrative employee is reduced by approximately 13%. Similarly, SERS currently assumes that employee salaries will grow on average 6.1% per year over a career, which is much higher than actual experience over the past 15 years. Lowering this actuarially assumed rate of salary growth by even a conservative 1% also yields a 13% reduction in the pension liability associated with an employee.

Extended across the entire pool of currently employed SERS members, steps like these could dramatically reduce actuarial liabilities without fundamentally altering the existing pension structure.

Beneficiary Salary and Annuity Amounts

Public employee annuities are determined by an employee’s years of service and final salary at retirement. For each additional year worked, the annuity an employee will receive at retirement increases as a percentage of the employee’s final salary. The graph to the right shows the relationship between years of service and retiree annuities for SERS. Notably, even employees who have worked for the Commonwealth the longest, 30 or more years, receive annual annuities that average just under \$50,000, or approximately 69% of their final salary. Employees with 15-19 years of service receive only about \$18,000 per year in annuity payments. For PSERS, average annuities range from \$1,900 per year (8.5% of final salary) for employees with fewer than five years of service to \$73,000 per year (85% of final salary) for employees with 40 or more years of service.

Average Salaries and Annuities for SERS Beneficiaries



Source: SERS, Pennsylvania Treasury

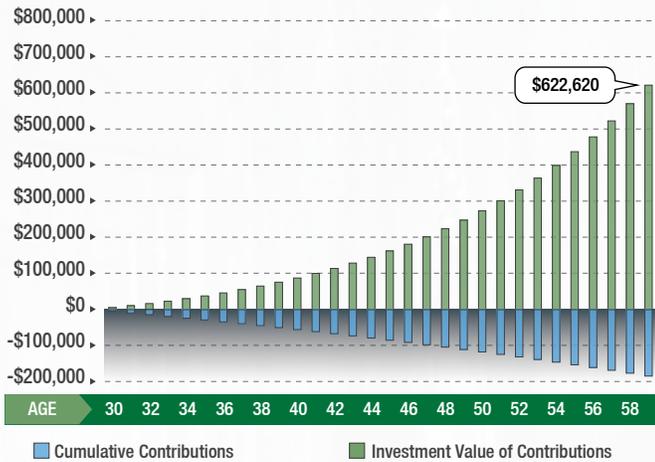
Retirement Sketches

The following retirement sketches compare John, Jane, and Alex. Each is 30 years old and has an annual salary of \$40,000 that increases 2% annually. They each work 30 years and expect to live until 85. The following charts on the left show their investment balances above the x axis and their cumulative contributions below the x axis. The charts on the right show annual retirement income by the bars referenced on the right y axis, with the corresponding investment balance by solid areas referenced on the left axis.

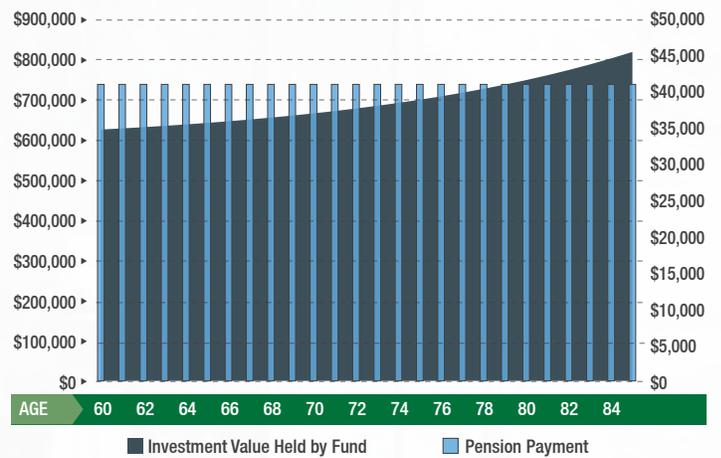
JOHN

John's employer offers a defined benefit plan. Each year John and his employer contribute to the pension plan, in total, an amount equal to 11.35% of his salary. At his retirement, John's defined benefit plan has a balance of \$622,620 from these contributions after they earn an assumed 7.5% rate of return. John receives a monthly pension totaling \$40,981 per year for the rest of his life from the defined benefit plan. Because his contributions remain with the pension plan, are pooled with other diverse participants, and can be invested more aggressively, the investment balance continues to grow and remains available if John lives longer than expected.

- Accumulation -



- Distribution -



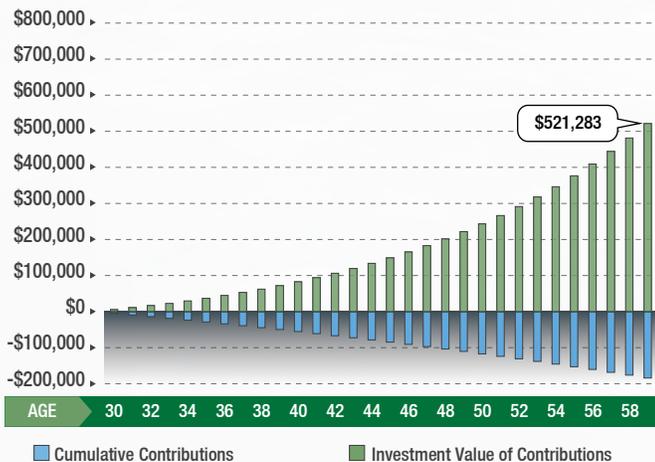
Source: Pennsylvania Treasury

JANE

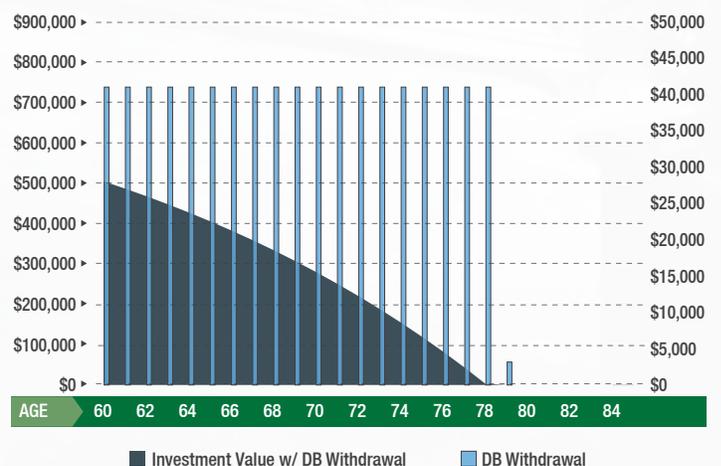
Jane's employer offers a defined contribution plan. Each year Jane and her employer contribute to the retirement plan, in total, an amount also equal to 11.35% of her salary. Some research has indicated that individual investing performance (as in defined contribution plans) lags behind professional investing (as in defined benefit plans) by as much as 2% per year. Even assuming that Jane's investments earn only 1% less per year than John's, she will have accumulated just \$521,283 in investment capital at retirement – nearly twenty percent less than John – for her retirement payments.

To avoid market fluctuations during retirement, Jane will likely invest more conservatively. Assuming a 5% return on her investments in retirement and the recommended annual 4% withdrawal of her investment balance, her starting annual retirement income would be only \$20,851. Her annual pension will slowly increase with 4% withdrawals because her account grows at a slightly higher rate. If Jane withdrew \$40,981 per year to match John's retirement income, she would run out of money at age 79.

- Accumulation -



- Distribution -



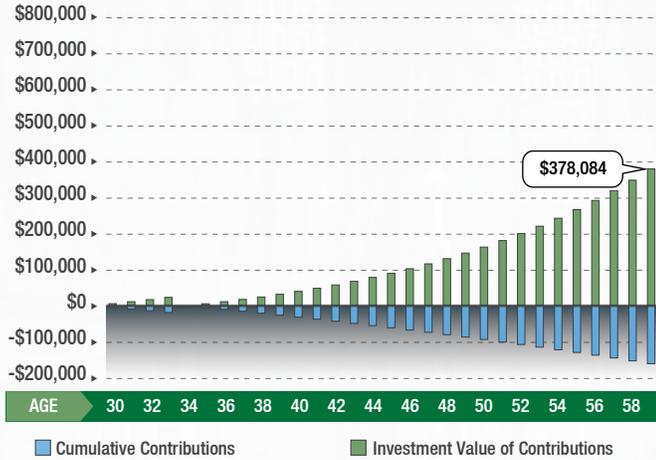
Source: Pennsylvania Treasury

Retirement Sketches (continued)

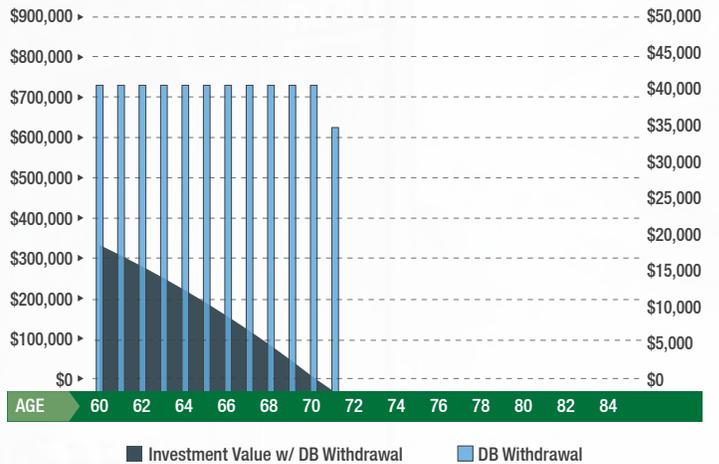
ALEX

Alex's employer offers a defined contribution plan that is effectively identical to the one provided to Jane. Alex, however, leaves her first job after five years and – as 30% of defined contribution plan participants typically do – cashes out her plan contributions to that point. Alex immediately returns to work, and contributions to her new defined contribution plan resume at the same rate and with the same returns. When Alex retires, her retirement account balance will be only \$378,084 (based upon 25 years of contributions totaling \$160,553). If Alex follows the 4% withdrawal guideline, her annual pension income will be just \$15,123; if she tries to match John's \$40,981 annual pension income, she will exhaust her retirement account at 71. By cashing out those first five years of contributions – less than \$23,000 – Alex loses roughly eight years of annual retirement income of \$40,981.

- Accumulation -



- Distribution -



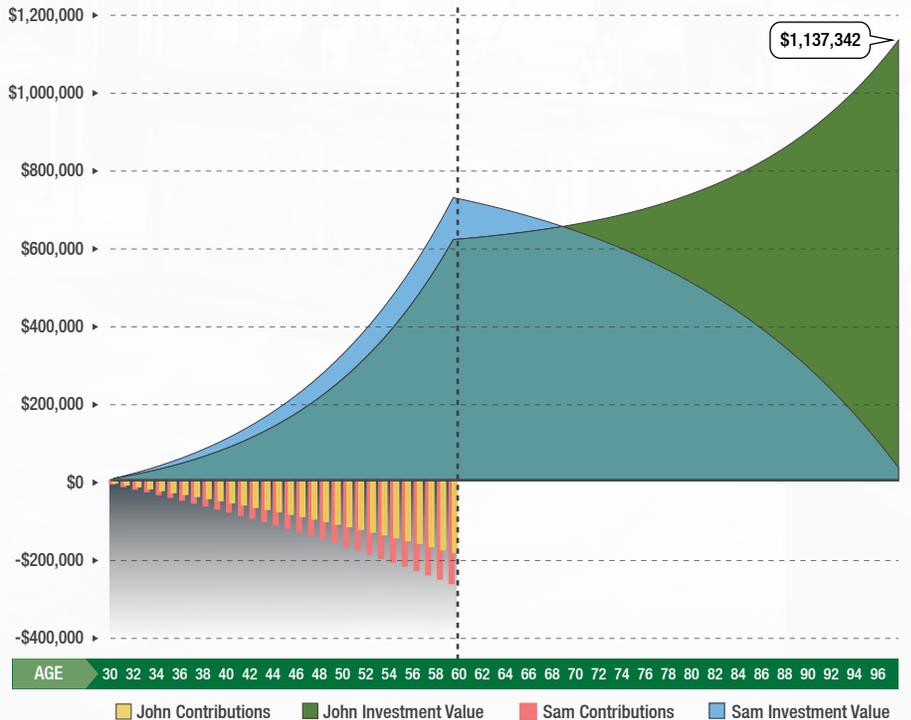
Source: Pennsylvania Treasury

A Consolidated Comparison

A small change in contribution levels combined with differences in performance during both working and retirement years can have a profound effect on retirement income.

The chart to the right provides a combined comparison of contributions and investment balances in both working and retirement years for two individuals – John from our earlier comparison and a new employee named Sam, who participates in a defined contribution plan. Sam matches all of the characteristics of our other employees and wants to equal John's retirement income of \$40,981 per year. Contributions into Sam's retirement – regardless of the source – must be nearly 43% greater than John's to make up for the 1% difference in investment performance during her working years, and to retire with an amount to match John's retirement income. If Sam and John are in a cohort where they have a 20% chance to live past age 97, John can continue to rely upon his pension for the rest of his life while Sam – despite having invested 43% more in contributions – will run out of money at that age (due to a more conservative allocation generating only a 5% return during the retirement period). John's defined benefit plan account continues to grow, even after withdrawals, since it is pooled with other investors and can continue to earn 7.5% annually even during his retirement.

- Accumulation and Distribution in Defined Benefit vs. Defined Contribution Plans



Source: Pennsylvania Treasury