

## Talking Points | January 2017

### **“(No) Money in the Bank: Which Retirement Systems Penalize New Teachers?”**

A report released by the Thomas B. Fordham Institute that misleads new teachers about their retirement benefits in teacher retirement systems.

- Even though teachers earn less than other women with college degrees, teachers 65 and older have the highest amount of household income with income from a teacher defined benefit (DB) pension providing more household income than women of the same age in other professions.
- Having experienced teachers in our nation’s K-12 classrooms is key to children getting a quality education. Nine out of ten teachers return to teach in classrooms the next year and only a small minority of teachers move outside of their school district. New teachers who decide that teaching is not a lifetime career for them leave the profession at higher rates than more experienced teachers.
- Teachers highly value retirement plans as an extremely valuable job feature. The DB pensions that cover the vast majority of teachers address an essential retirement security need - replacing income when one stops teaching. The DB pension adds value by assuring that teachers cannot exhaust their retirement savings and will not be hurt by investment losses and inflation. School systems use pensions to recruit, retain and manage the teaching workforce.
- Teachers who leave the profession before retirement and who request refunds require the plan to invest more in liquid investments that provide lower returns compared to the fund’s total return over the long term.
- Defined contribution plans help teachers manage employment risk, making portability easier for teachers who leave. However, studies have shown that workers need to save more in a defined contribution plan to offset lower returns in self-directed retirement accounts and make sure that retirement savings last for as long as a teacher will live. Teachers live longer than average workers.
- Yes, states have revised teacher’s retirement systems, often by increasing new teachers’ plan contributions. But, the calculation of the crossover point by the report appears to have major flaws. First, it compounds employee contributions using inconsistent investment returns - a five percent interest rate for DC retirement accounts but then artificially credits DB member accounts with the assumed rate of return used to calculate the employer’s contribution needed to meet future plan liabilities.
- A more serious flaw in the methodology appears to low-ball the value of monthly pension payments to teachers over their retirement years. The calculation uses life expectancy based on years before new teachers started teaching, rather than the appropriate future life expectancy in thirty years from now when they will retire. Assuming teachers will receive six years less in retirement payments than they are likely to receive on average significantly understates the amount to support promised benefits.
- Calculations for school districts conflict with results of more extensive analyses of alternative retirement plan designs done for teacher pension plans. Colorado Public Employees Retirement Association (COPERA) is an example of a retirement system recently studied by the state’s auditor in an extensive 217-page analysis of typical teacher tenure patterns based on several plan design alternatives. In every situation, COPERA’s hybrid defined benefit pension replaced a higher level of income than all of the alternative designs. For example, even a teacher who teaches for only three years would receive 40 percent more retirement income from COPERA than from investing the \$6,700 refund and buying an annuity.

## BACKGROUND

### Historical Data on Teacher Attrition Rates

Teacher effectiveness increases with experience. Education policy research on teacher attrition and longevity has documented this link and its impact on education quality.<sup>1</sup> So the fact that the median job tenure for public school teachers and other public sector employees is twice as long as the median job tenure periods of private sector workers bodes well for our childrens' futures.

The National Center for Educational Statistics (NCES) publishes data on the changes in teacher attrition patterns using its Schools and Staffing Survey and the Teacher Follow-up Survey. Since the 1988-89 school year through the 2012-13 school year, the overwhelming majority of public school teachers returned to the classroom the following year, even while the profession added nearly a million additional teachers to its ranks since 1989.

**Table 1** below indicates the percent of teachers NCES defines as “stayers” who teach the following year in the same school, “movers” who are still teaching but in a different school and “leavers” who leave the teaching profession. In the 2012-13 school year, 84 percent of the teachers returned to teach in their same school while eight percent moved to another school and another eight percent stopped teaching. The NCES follow-up survey for 2012-13 indicated that about six out of 10 of the mover teachers moved to a school within the same school district so roughly 89 percent of teachers continued teaching for the same school district.<sup>2</sup>

While teacher retention patterns have changed slightly during the observation period, the changes in the percentage of teachers who stay in the same school district remain quite similar with its highest points in 1991-92, when about 91 percent of teacher stayed in the same school district, and 2012-13, when about 89 percent of teachers stayed in the same school district. The vast majority of public school teachers have pension benefits provided by statewide teacher retirement systems, so these school district retention levels would likely understate pension plan retention levels, given that the NCES data does not report teacher mobility by state.<sup>3</sup>

**Table 1: Percentage distribution of public school teacher stayers, movers, and leavers: 1988-89 through 2012-13**

Year	Number	Percent		
	Total base year teachers	Stayers	Movers	Leavers
1988-89	2,386,500	86.5	7.9	5.6
1991-92	2,553,500	87.6	7.3	5.1
1994-95	2,555,800	86.3	7.2	6.6
2000-01	2,994,700	84.9	7.7	7.4
2004-05	3,214,900	83.5	8.1	8.4
2008-09	3,380,300	84.5	7.6	8.0
2012-13	3,377,900	84.3	8.1	7.7

Source: Goldring, R., Taie, S., and Riddles, M. (2014). Teacher Attrition and Mobility: Results From the 2012–13 Teacher Follow-up Survey (NCES 2014-077). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved January 26, 2017 from <http://nces.ed.gov/pubsearch>.

Not unexpectedly, the attrition data for new teachers starting their careers in the classroom shows a higher level of movement to other schools and out of the teaching profession than more experienced teachers display. Among public school teachers with one to three years of experience in 2012-13, 80 percent stayed in their base-year school, 13 percent moved to another school, and seven percent left teaching, as illustrated in **Table 2** below.<sup>4</sup> The one exception is that teachers with 20 or more years of experience leave the profession at higher rates, most often because they retire:

**Table 2: Percentage distribution of public school teacher stayers, movers, and leavers, by teaching experience in the base year: 2012-13**

Teacher or school characteristic in base year	Number	Percent		
	Total	Stayers	Movers	Leavers
Total	3,377,900	84.3	8.1	7.7
Teaching experience				
1-3 years	398,500	80.4	12.5	7.1
4-9 years	919,500	81.5	11.7	6.8
10-19 years	1,205,400	88.5	5.6	5.9
20 years or more	854,500	83.2	5.4	11.4

Source: Goldring, R., Taie, S., and Riddles, M. (2014). Teacher Attrition and Mobility: Results From the 2012–13 Teacher Follow-up Survey (NCES 2014-077). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved January 26, 2017 from <http://nces.ed.gov/pubsearch>.

NIRS has found that workers place almost equal importance on having a retirement benefit that provides them with a way to replace their paycheck when no longer working due to retirement and having a plan with benefits that are portable.<sup>5</sup> Portability of retirement benefits may be a desired feature for the small (roughly 8%) percentage of teachers who leave the profession or the even smaller percentage of the teacher workforce that relocates to other states and becomes covered by different teacher retirement systems. However, moving from defined benefit pensions that provide teachers with lifetime retirement income to defined contribution retirement savings plans may deliver lower benefits for the large majority of teachers who spend a significant number of years teaching our children, especially if the intent is to keep the cost of providing retirement benefit the same.<sup>6</sup> Moreover, teacher pension plans have proven to be an important source of household income for women who worked in the education field. Women educators have the highest amount of household income when they are 65 and older compared to other women of the same age who worked in other career areas.<sup>7</sup>

### **Defined Benefit Pension Plans**

Defined benefit (DB) pension plans provide teachers with a benefit based on a formula that takes into account final average salary and years of service with a multiplier that determines what percentage of final income the teachers' pension checks will replace each month. Public teacher pension plans first started with teachers sharing the cost of the plan with employers. Public retirement systems generally have incorporated cost sharing with both employers and employees contributing toward the retirement benefits. Employee contributions are maintained in member accounts for record keeping should the employee leave and request a refund.<sup>8</sup>

Teachers can easily calculate the level of income replacement from their pension by using its benefit formula. If a teacher works for 25 years and the teachers' plan provides two percent of final average salary for each year of service, then her DB pension will replace half (50%) of her earnings. Many teacher retirement plans also provide a cost of living adjustment to protect against inflation eroding the teacher's benefit. From an employee's viewpoint, benefit accruals under a DB pension tend to follow the economic lifecycle model with benefit values increasing over a career as teachers have more service and higher earnings. Benefits keep increasing when an employee is most focused on retirement as one's target retirement age approaches.

One risk that a teacher can experience in a DB pension is employment risk. Should a teacher stop teaching, the pension plan's level of benefits will reflect shorter service and lower average earnings at time of termination. The teacher can usually keep their member accounts in the plan or request a cash refund. The majority of statewide public retirement systems refund employee contributions with some level of interest. NIRS published details of the portability features offered in teacher retirement systems in more details in *Preserving Retirement Income Security for Public Sector Employees*. If the teacher leaves before completing the pension vesting period, she is generally not eligible to receive a retirement income benefit and the member account is refunded, although some plans have exceptions.<sup>9</sup>

Employers bear most of the risks in defined benefit pensions. They must predict the cash flow needed each year to pay benefits and make refunds, assume the longevity risk and assure employees that they will not run out of money, and invest the assets held by the plan collectively in a trust with a long term outlook that can span up to 50 or more years. The plan uses estimated investment returns over that long duration when it generates funding calculations designed to meet its obligations. There is no guarantee that the plan will reach its assumed return and actuaries adjust the employers' contributions each year based on actual earnings and other gains or losses experienced on key assumptions.

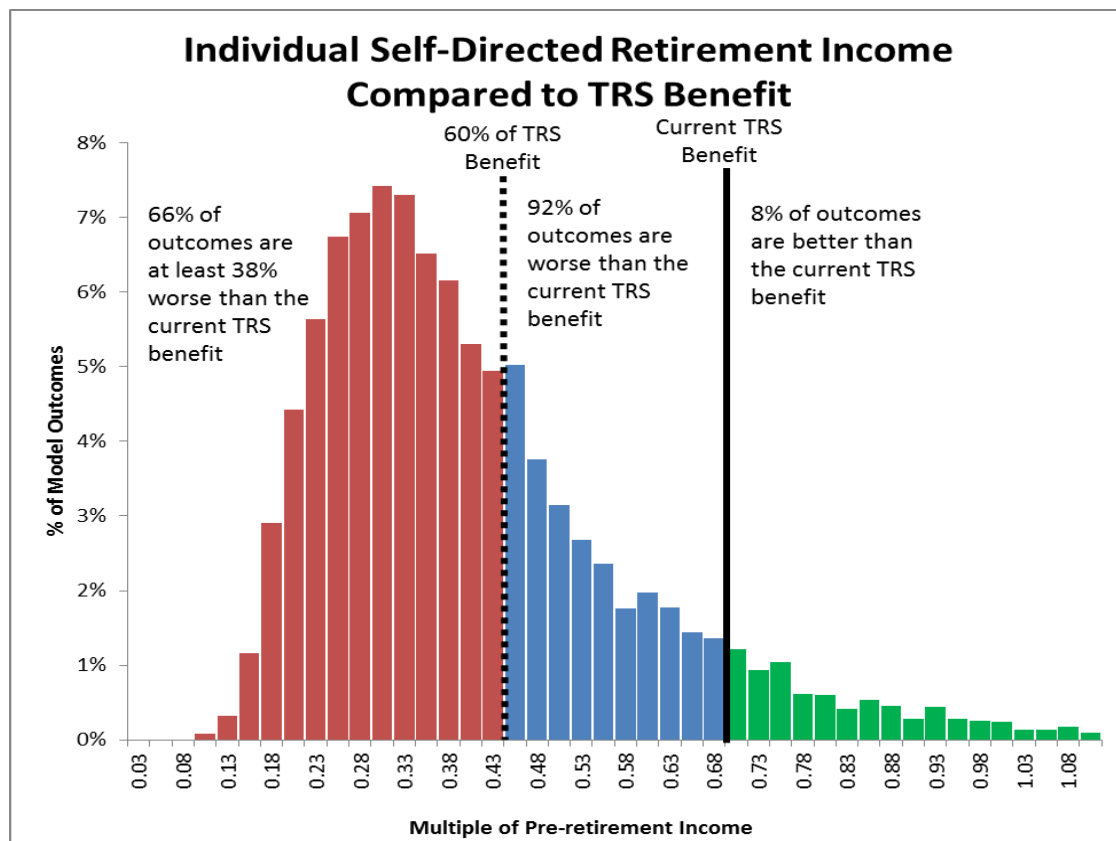
Teacher retirement systems credit member accounts with an interest rate that is less than the assumed return on the trust fund since they protect employees against losses of principal when financial markets lose value and refunds require the plan to maintain more funds in liquid investments generally associated with lower returns.<sup>10</sup> Public sector employers benefit when taking on the risks in pension plan because these benefits enable employers to manage their workforce: attracting and retaining proficient teachers and encouraging timely retirements at the end of careers. Public employees rate their retirement plans as an important job feature significantly higher than do private sector workers.

### **Defined Contribution Retirement Savings Plans**

Reflecting different workforce needs and higher employee turnover, private sector employers have switched the method of retirement benefits they provide over the last four decades toward defined contribution (DC) retirement savings plans, such as 401(k) plans. In these plans, employers match, in part, contributions made by employees, and the employer contributions have up to three years to fully

vest under ERISA. In DC retirement plans, employees bear the majority of the risks in the plan, as they are responsible for not only managing their investments, but they also face longevity and inflation risk.

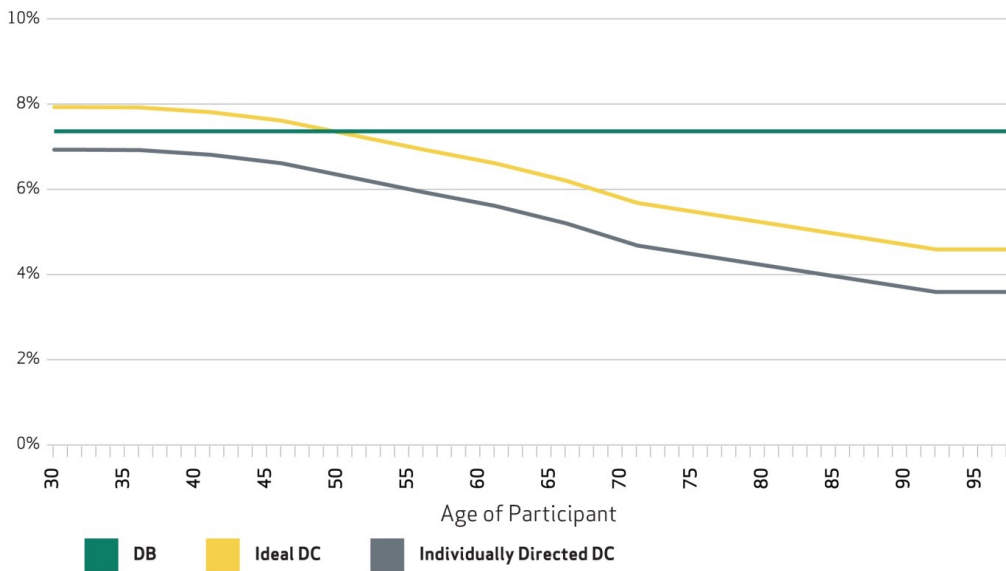
Typically, DC plans allow the employee to make all investment decisions for their accounts, which has lead to employees not properly diversifying their retirement accounts or making poor choices when adjusting their asset allocations. (Mercer/ AON) A study by the Texas Teacher Retirement System (TRS) used simulations of probable investment outcome to illustrate potential results for teachers should they participate in a DC plan compared to the level of benefits provided under TRS. It determine that teachers would have only a 50% chance of reaching 60% of the benefit provided by the DB plan, at the same cost. The figure below summarizes the TRS findings.<sup>11</sup>



In response to poor employee investment choices, many DC retirement savings plans now also use tools from behavioral economics and automatically default employee savings in DC accounts into target date funds (TDFs). These funds adjust investment allocations along a glide path that moves assets to more conservative funds over time as employees approach retirement. NIRS compared the rates of return for an individual teacher using a DC retirement account invested in a TDF with the investment returns over

a working career earned by the typical public teacher pension plan. The consistent optimal long-term investment allocation found in public DB pensions delivered an investment advantage over the TDF approach that translated into a 10 percent cost advantage for the DB approach. The figure below illustrates the rates of return for the target date funds as modeled by NIRS.<sup>12</sup>

Figure 6: **Expected Annual Investment Return (Net of Fees)**



An advantage of a DC account is that it is easy for the small minority (about three to six percent) of Mover teachers to take the amounts in their retirement accounts and move to a new retirement plan if they choose to teach in a different state. Teacher pensions allow employees to transfer funds from member accounts and DC plans to purchase additional service under the new pension plan. For those teachers who leave the profession, the members account accumulated with interest from most pensions can be withdrawn as a lump sum, or they can choose a deferred retirement benefit if the departing teacher has vested in the teacher pension plan.<sup>13</sup>

Teachers covered by DC retirement plans do not automatically have an option for retirement income replacement unless they choose a lifetime annuity, and they may run out of funds in the DC account if too much is withdrawn in the early years of retirement. In contrast, the DB pension pools longevity risk across all retirees. The individual teacher with a DC retirement account must actually save additional money if she wants to have a greater than 50 percent chance of not exhausting retirement savings while still having more years to live. Both options would require additional costs, and NIRS estimates that 10 percent more is needed at retirement to make sure teachers have only a 1 in 5 chance of running out of money in their DC retirement account.<sup>14</sup>

### **Crossover Calculation Issues in the Thomas Fordham Institute Analysis**

Like private sector workers, public school teachers have also experienced changes to the benefits promised in the future by teacher retirement systems as legislation in nearly every state has enacted adjustments to assure that future retirement income benefits can be sustained. The larger majority of systems maintained the defined benefit format when states made these adjustments. The most prevalent changes included increasing the employee contribution levels, raising the plan's retirement age, reducing the benefit formulas, and changing future cost of living adjustments.<sup>15</sup> At the same time, the high importance that public employees attach to their retirement benefits, the workforce management aspects of defined benefit plans, and the cost efficiencies of DB pensions have influenced these changes and resulted in maintaining the DB pension format.<sup>16</sup>

The Thomas B. Fordham Institute study calculates a point that its authors describe as a crossover point for new teachers reflecting these pension changes. Employee contributions in most DB teacher retirement systems are set as a steady percent of salary over a teachers career, as it would be in a DC or combined DB/DC retirement plans covering teachers.

In determining the crossover point, the report calculates the accumulated value of a teacher's contributions in a way that has no relevance to the DB pension or the author's preferred retirement approach using a DC retirement account. In fact, compounding the value of teachers' contributions to their pensions with the interest rate the plan assumes for determining the amount the employer must contribute to meet future obligations actually would confer an added value to teachers from participating in the pension plan.

The pooled investments managed by the public pension's professional managers deliver long-term returns greater than individuals achieve, even though returns vary year to year and plans may lose value in shorter periods.<sup>17</sup> The study appears to understand that DC account returns are lower in **Figure 5**. When considering the Alaska Teacher Retirement System, the study uses a five percent interest rate to illustrate the accumulated value of a teacher's contributions to the Alaska DC retirement accounts. This rate would be the more appropriate interest rate to use for accumulating the value of all teachers retirement contributions. Using the assumed earnings rate overvalues employee contributions, which they recommend should be contributed to a DC retirement account instead of the teacher pension plan.

The authors take much effort to get teacher salary scale data from each school district and defined benefit pension features from each retirement system covering the district, by way of suggesting the accuracy of the predictions. Yet there are key gaps in the calculation of the present value of the lifetime retirement income that each plan will provide to new teachers for as long as they live once they retire. Endnote 25 in the report indicated that data to determine the cost impact of the longevity risk that employers assume in the teachers DB pension plan is derived from a report issued by the Center on Disease Control (CDC) using life tables from 2007.<sup>18</sup>



This important component of the cross-over calculation understates the value of employers providing the longevity risk protection to teachers. Life expectancy, especially for teachers, has improved and is projected to continue to improve over time. More recent data from the CDC based on the life table from 2011 showed a half of year improvement in life expectancy over that four-year period.<sup>19</sup> This short-term gain illustrates that the true value of the benefits for new teachers who started teaching at age 25 in the 2012-13 school year must be projected to include longevity improvements over their lifetimes and properly reflect the gender mix of teachers.

For example, when NIRS evaluated the cost efficiency of DB pension plans providing longevity protection for female teachers, we used a more appropriate source to determine the longevity of healthy women teachers. The Generational RP-2014 Healthy Female Annuitants mortality table with projection under scale MP 2014 indicates a life expectancy at age 62 of 28 years.<sup>20</sup> This mortality table's 28 years life expectancy is six years longer than the life expectancy using CDC data for women age 62. Failing to account for six years of monthly pension payments in the Fordham Institute's analysis significantly understates the dollar amount need to provide pension benefit to teachers and would generate misleading higher crossover points.

#### **Analysis of Calculations for Colorado's Jefferson County and Benefit Under COPERA**

The Fordham Institute report indicates that the public plan provisions are accurate for every state, but the study does not properly reflect the vesting provisions for the Colorado Public Employees Retirement Association (COPERA).

Moreover, the results from a report that the Colorado state legislature tasked the state auditor to conduct of the Public Employees Retirement Association comparing both the level of benefits generated based on the existing cost and the cost to deliver the current benefit for employees under several different retirement plan designs calls the 21 year crossover point for the teachers in Jefferson County into question. In June 2015, the Office of the State Auditor released its "Comprehensive Study Comparing Cost and Effectiveness to Alternative Plan Designs" report that considered the state's hybrid defined benefit plan and how various typical employees would fare in alternative structures.<sup>21</sup>

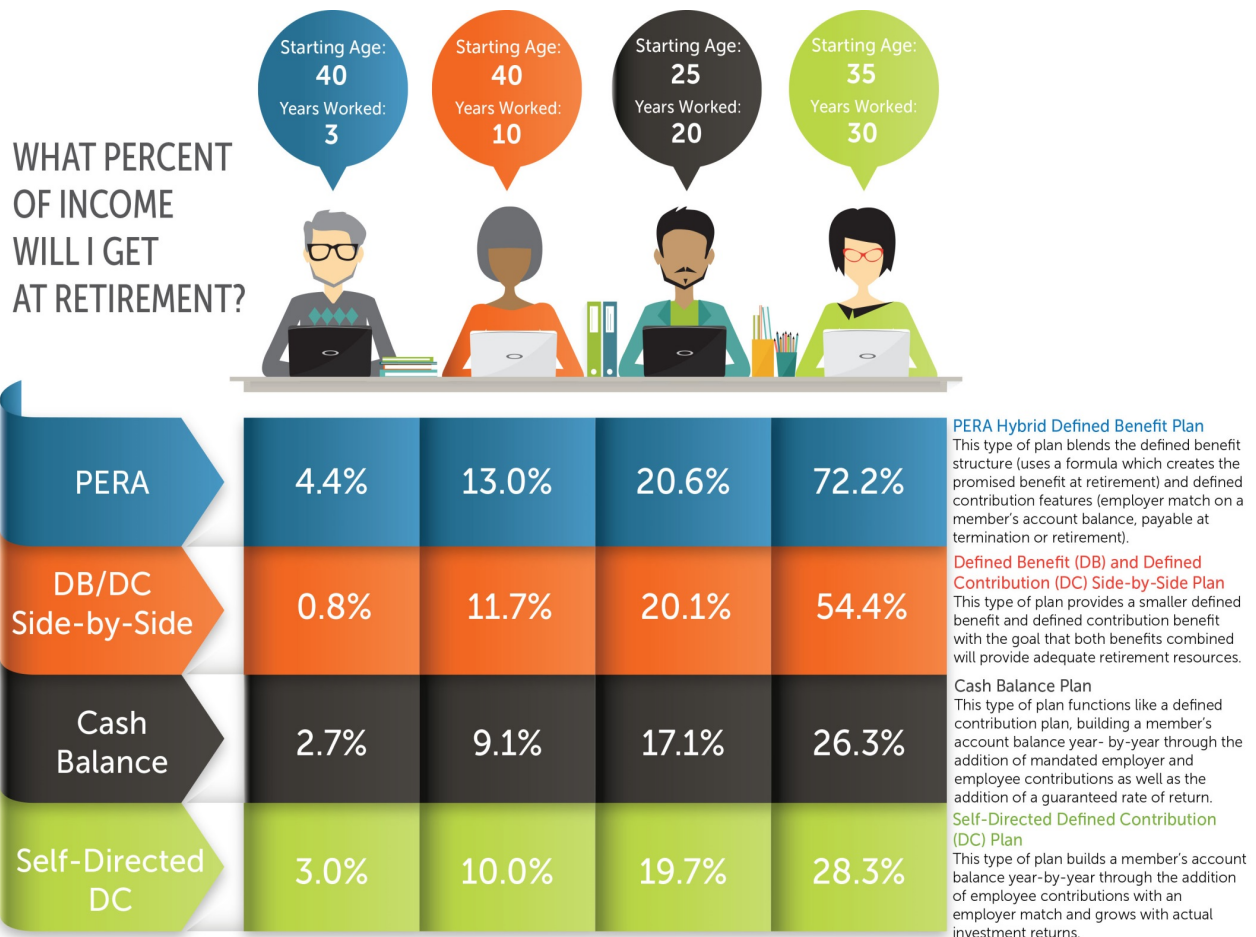
Totaling 217 pages, the extensive analysis in the auditor's report identified a clear trend. The existing hybrid DB pension offered by Colorado PERA delivered the highest level of income replacement of any plan design for all of the various age and service patterns selected to represent typical employees covered in the plan.<sup>22</sup> For example, the chart below compares the COPERA benefits to a side-by-side combined DB and DC alternative plan:





Comparison of Defined Benefit and Defined Contribution Side-by-Side Plan with PERA Hybrid Defined Benefit Plan					
Targeted Contribution Approach					
State Division					
				PERA Hybrid Defined Benefit Plan	Defined Benefit and Defined Contribution Side-by-Side Plan <sup>1</sup>
Employer Contribution <sup>2</sup>				0.82%	5.29%
Member Contribution <sup>2</sup>				8.00%	3.53%
Relative Cost (set equal)				100%	100%
REPLACEMENT RATIOS					
Age at Hire	Age at Termination	Years of Service	Benefit Commencement Age		
35	65	30	65	72.2%	54.4%
35	62	27	62	62.5%	46.5%
35	60	25	60	49.7%	37.7%
40	60	20	65	39.6%	31.3%
25	45	20	65	20.6%	20.1%
40	50	10	65	13.0%	11.7%
40	43	3	65	4.4%	0.8%
Source: Gabriel, Roeder, Smith & Company.					
<sup>1</sup> Features of the Alternative Plan: Defined benefit plan multiplier of 1.50% of final 3 year's pay, the Employer contributes 5.29% of pay. Defined Contribution Plan: Members contribute 3.53% of pay, the employer contributes 0% of pay, the fund earns 5.5% return each year; the account balance at age 65 is converted to a lifetime annuity based on 5.5% and the valuation mortality table.					
<sup>2</sup> Contribution amounts are calculated as a percentage of employee salary.					

Additionally, the figure below offers a summary of the level of income replaced at retirement age based on information in the state auditor's report for four specific employees with differing starting ages and periods of service under a self-directed DC plan and a Side-by-Side DB/DC plan and a Cash Balance plan. For each alternative design, the COPERA plan provides a higher benefit level than the other options when maintaining the same costs.



Source: A Comprehensive Study Comparing the Cost and Effectiveness to Alternative Plan Designs Authorized by Senate Bill 14-214.

Colorado PERA addresses the issue of leakage from retirement accounts with a favorable vesting policy for those employees who choose to preserve their member's accounts in PERA. For those former teachers, their member's accounts in COPERA compound with interest earnings equal to three percent until retirement age, at which time the plan fully vests accounts, even if teachers did not meet the five-year vesting period. At retirement, the plan matches 100 percent of the value accumulated in the member's account, and a teacher can purchase lifetime income at a favorable annuity rate which would generate more income than if the former employee succeeded in earning a five percent rate of return on funds from COPERA rolled over to a new DC retirement account.

For teachers who are vested and request a refund, COPERA includes a 50 percent match on the value of their member account in the refund, but again preserving the member account until retirement age in COPERA will provide a higher level of monthly pension income because the match would increase to 100 percent. While the discussion of the Jefferson County teacher suggests that the salary scale has a period of no increase for a few years mid-career, it does not appear to take into account the enhanced vesting

opportunity giving short service teachers better income replacement if they preserve their retirement contributions from their earnings.

Colorado goes a step beyond just giving teachers moving on check - they let non-vested employees get a more valuable benefit. Thus, it is incorrect to state that a teacher in Colorado who terminated before the paper's crossover point gets no net benefit.

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- <sup>1</sup> NIRS Boivie, I. 2011. *The Three Rs of Teacher Pension Plans: Recruitment, Retention, and Retirement*. NIRS, Washington, DC. Retrieved at: [http://www.nirsonline.org/storage/nirs/documents/3R%20Teacher%20Pensions/final\\_oct\\_31\\_3rs\\_issue\\_brief.pdf](http://www.nirsonline.org/storage/nirs/documents/3R%20Teacher%20Pensions/final_oct_31_3rs_issue_brief.pdf).
- and McGee, J. and Winters, M. 2016. *Better Pay, Fairer Pensions III: The Impact of Cash-Balance Pensions on Teacher Retention and Quality*. Manhattan Institute, New York, NY. Retrieved at <https://www.manhattan-institute.org/html/better-pay-fairer-pensions-iii-9006.html>
- <sup>2</sup> Goldring, R., Taie, S., and Riddles, M. (2014). *Teacher Attrition and Mobility: Results From the 2012–13 Teacher Follow-up Survey* (NCES 2014-077). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved January 26, 2017 from <http://nces.ed.gov/pubsearch>.
- <sup>3</sup> For example, in CALSTRS 3 out of 4 current teachers will retire with at least 20 years of service and about 1/2 will retire with at least 30 years according to Rhee, N. and Fornia, W. 2016. *Are California Teachers Better off with a Pension or a 401(k)?*. UC Berkeley Center for Labor Research and Education, Berkeley, CA.
- <sup>4</sup> Goldring et al. 2014. Op.cit.
- <sup>5</sup> Oakley, D. and Kenneally, K. *Retirement Security 2015: Roadmap for Policy Makers |Americans' Views of the Retirement Crisis*. NIRS. Washington, DC
- <sup>6</sup> Rhee and Fornia. 2016. Op. cit. and Rhee, N. and Fornia, W. 2014. *Still a Better Bang for a Buck*. NIRS Washington, DC.
- <sup>7</sup> Brown, J. et al. 2016. *Shortchanged in Retirement: The Continuing Challenges to Women's Financial Future*. NIRS. Washington, DC.
- <sup>8</sup> Oakley, D. and Brown, J. 2016. *Preserving Retirement Income Security for Public Sector Employees*. NIRS, Washington, DC. Retrieved from [http://www.nirsonline.org/storage/nirs/documents/Portability%20Report/preserving\\_security\\_public\\_sector\\_web.pdf](http://www.nirsonline.org/storage/nirs/documents/Portability%20Report/preserving_security_public_sector_web.pdf).
- <sup>9</sup> Ibid. Op.cit.
- <sup>10</sup> Ibid. Op.cit.
- <sup>11</sup> Texas TRS study retrieved from:
- <sup>12</sup> Rhee and Fornia. 2014. Op.cit.
- <sup>13</sup> Oakley and Brown. 2016. Op. cit.
- <sup>14</sup> Rhee and Fornia. 2014. Op.cit.
- <sup>15</sup> Brainard, K. and Brown, A. 2016. *Spotlight on Significant Reforms to State Retirement Systems*. NASRA, Washington, DC.
- <sup>16</sup> Rhee, N. and Oakley, D. 2012. *On the Right Track? Public Pension Reforms in the Wake of the Financial Crisis*. NIRS. Washington, DC.
- <sup>17</sup> Rhee and Fornia. 2014. Op.cit.
- <sup>18</sup> Arias, E. 2011. "United States Life Tables 2007." *National Vital Statistics Reports 59.no.9*. National Center for Health Statistics. Hyattsville, MD. data retrieved at [https://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_09.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_09.pdf)
- <sup>19</sup> Arias, E. 2015. "United States Life Tables 2011." *National Vital Statistics Reports 64.no. 11*. National Center for Health Statistics. Hyattsville, MD. Retrieved at [https://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64\\_11.pdf](https://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_11.pdf).
- <sup>20</sup> Rhee and Fornia. 2014. Op.cit.



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<sup>21</sup> Thompson, L. and Hunt, D. 2015. *A Comprehensive Study Comparing the Cost and Effectiveness to Alternative Plan Designs Authorized by Senate Bill 14 -214*. The Office of the Sate Auditor, Denver, CO. retrieved at: [https://www.colorado.gov/pacific/sites/default/files/PERA\\_SB%2014-214%20Alternative%20Plan%20Design%20Study.pdf](https://www.colorado.gov/pacific/sites/default/files/PERA_SB%2014-214%20Alternative%20Plan%20Design%20Study.pdf).

<sup>22</sup> Ibid. Op.cit.