THE REAL DEAL FOR THE PUBLIC SECTOR

RETIREMENT INCOME ADEQUACY AMONG U.S. PUBLIC SECTOR EMPLOYEES

By Eric Atwater, Tyler Bond, Dan Doonan, and Emily Swickard

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I. INTRODUCTION

Saving and preparing for retirement is one of the biggest financial challenges most American workers will undertake during their careers. Retirement benefits rank right at the top alongside salary and health insurance as priorities for working people. Defined benefit (DB) pension plans remain prevalent in the public sector. Eighty-six percent of state and local government employees have access to a pension plan, as do federal employees. The prevalence of DB plans in the public sector has led to a perception that most public employees are set for retirement. But in reality, even those workers with strong pension benefits may fall short of achieving retirement income adequacy according to their individual retirement needs. This is particularly true for workers in less generous tiers of benefits.

The Real Deal for the Public Sector explores different metrics for evaluating retirement income adequacy for public sector employees. The analytical model for this research is based upon previous work done by Aon in analyzing retirement adequacy for the private sector through their series of The Real Deal reports. This research takes that model and adapts it to the unique features and characteristics of a typical public sector pension plan. It also considers differences in public sector retirement plan provisions, such as whether a worker is in a DB or defined contribution (DC) plan, and whether or not they participate in Social Security.

The results not only suggest actions that individual savers might take to improve their retirement income adequacy, but also what elements legislators and other policymakers could consider when evaluating the design of retirement plans for public workers. Most of the public sector retirement reform in recent years appears to have focused on cost and not factored in retirement income adequacy, nor the impact of employees not being able to retire in an orderly fashion.

This paper seeks to answer the following questions:

- How much do employees need for an adequate retirement?
- How adequate of a retirement does the average public sector plan provide? What is the shortfall or surplus of the average plan?
- What is the impact on retirement readiness of having:
  - Retiree medical, often referred to as other post-employment benefits (OPEB) plans
  - Social Security
  - Cost-of-living-adjustment (COLA)
- Do “cost-neutral” DB and DC plans provide the same retirement income for participants?
- What is the impact on retirement shortfall or surplus of a high or low investment return environment?

Answering these questions should provide more clarity to public sector employees and plan sponsors about the adequacy of common retirement plans offered in the public sector.
II. DESIGNING THE ANALYSIS

Retirement Income Adequacy Defined

This report defines retirement income adequacy simply: retirement income is adequate when retirement resources meet or exceed retirement needs.

Retirement resources include DB or DC plan income, Social Security, and retiree medical plan benefits. Retirement needs are the assets required to maintain a preretirement standard of living during retirement years. The definition of retirement needs keeps in mind three facts. First, saving for retirement is no longer necessary during retirement. Second, taxes generally decrease for retired workers. Third, costs can increase over time, including healthcare costs. All of the resources and needs for each worker in the analysis are summed up and then the total resources and total needs are compared to determine if there is an expected shortfall or surplus.

Retirement Needs

Simply put, retirement needs are the sum of money an employee must have at retirement to last through all their retirement years. Individuals need an income that will allow them to maintain their preretirement standard of living over a postretirement lifetime. This premise follows from an existing body of research on retirement readiness that focuses on maintaining a preretirement standard of living. AS noted above, this research considers changes in needs that are expected to occur at retirement. Also, it recognizes that some individuals personally may choose to reduce their standard of living during retirement, which requires fewer resources.

This research begins by determining the amount of income a person needs in the first year of retirement to maintain their standard of living. This is done by calculating the annual income that the employee expects to have right before retirement by projecting each employee’s current pay to retirement age using an assumed pay growth rate. This amount is then adjusted to account for the following changes that occur at retirement.

Saving for retirement is no longer necessary once an individual begins retirement, so projected pay is reduced by the amount of the individual’s contributions to their retirement plans.

Taxes payable after retirement generally decrease from preretirement levels, so each employee’s projected pay is reduced for the anticipated difference. Taxes are reduced primarily because a portion of Social Security benefits is not subject to taxation and retirees are no longer paying Federal Insurance Contributions Act (FICA) taxes on wages. Gross

<table>
<thead>
<tr>
<th>Resources</th>
<th>Needs</th>
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<tbody>
<tr>
<td>Employer-provided benefits</td>
<td>Preretirement pay adjusted to reflect:</td>
</tr>
<tr>
<td>‧ Defined benefit (DB)</td>
<td>‧ No longer saving for retirement</td>
</tr>
<tr>
<td>‧ Defined contribution (DC)</td>
<td>‧ Change in taxes</td>
</tr>
<tr>
<td>‧ Retiree medical</td>
<td>‧ Higher medical costs</td>
</tr>
<tr>
<td>‧ Employee savings in plan</td>
<td></td>
</tr>
<tr>
<td>‧ Social Security</td>
<td></td>
</tr>
</tbody>
</table>

Resource shortfall results in lower standard of living if not compensated by other assets or postretirement employment
income also may be lower after retirement, and a lower tax bracket may be applicable.¹

Healthcare expenses generally increase during retirement. As individuals retire and move from active employee healthcare to retiree healthcare, they can see dramatic increases in healthcare premiums and out-of-pocket costs, especially if they do not have access to an employer plan. Moreover, the rate of healthcare inflation is markedly higher than general price inflation. The typical active employee pays 25 to 30 percent of their healthcare costs, while the typical future retiree likely will pay a higher percentage of those costs, depending on the subsidy offered by their employer. The study projects the dollar cost of retiree medical insurance, focusing on the incremental increase in moving from active employee to retiree. This incremental cost has been added to the retirement income needs.

Healthcare costs, relative to pay, vary across generations because medical inflation is expected to be higher than both regular inflation and salary increases. As a result, retiree medical costs are likely a smaller percentage of income today than they are expected to be in the future. Medical inflation and capped or declining employer subsidies for retiree health benefits are eroding retirement resources.

Healthcare costs also vary somewhat by income level based on government subsidies. While Medicare premiums are lower at lower income levels and Affordable Care Act subsidies provide some assistance to low-income participants, these participants still have much higher medical needs as a percentage of their income than high-income participants.

After accounting for these changes that occur at retirement, the income needed to maintain the standard of living in the first year of retirement generally is less than the preretirement income.

The analysis then takes the annual income needed throughout retirement for an average life expectancy and calculates a single-sum amount that represents the amount of assets needed at retirement to maintain a preretirement standard of living throughout retirement. The model presents this single-sum value as a multiple of projected pay at retirement.

**Retirement Resources**

This study recognizes retirement resources from three sources in the baseline scenario—Social Security, a DB pension plan, and retiree medical. The potential of employer contributions and employee savings in a defined contribution plan are assessed in alternative scenarios. To determine whether an employee will have adequate retirement income, total needs are offset by the resources provided by these sources. Employee savings outside of employer plans are not included in the study since they are not straightforward to capture across a population and are often fairly small for a typical employee.

Like needs, resources in *The Real Deal* are expressed as a multiple of projected pay at retirement (“multiple of pay”). Some retirement resources, such as Social Security and certain DB plan benefits, are payable only as fixed monthly installments over the employee’s lifetime. *The Real Deal* expresses these fixed installments as the single-sum amount at retirement that, when invested, would provide an equivalent stream of payments designed to last through the employee’s expected age at death.

**Replacement Ratios and Multiples of Pay**

The model used for this paper expresses retirement needs and resources as a multiple of projected pay at retirement. Through this approach, *The Real Deal* can compare the retirement resources and needs of people retiring at different times in the future.

Traditionally, retirement adequacy has been expressed in terms of replacement ratios—the income needed in the first year of retirement as a percentage of income earned right before retirement. The replacement ratio approach typically focuses solely on income adequacy at the point of retirement and does not consider subsequent adequacy. In contrast, a multiple-of-pay approach provides a target that enables employees to maintain their preretirement standard of living throughout all their retirement years, rather than merely in the first year of retirement. This
measure also allows the study to reflect future inflation and medical trends, which cannot be easily captured in a year-of-retirement replacement ratio.

*The Real Deal* can analyze retirement income adequacy based on the surplus or shortfall of retirement resources versus retirement needs.

- **If retirement resources exceed retirement needs,** then the individual can anticipate a retirement income surplus through an average postretirement lifetime or can consider retiring at an earlier age.

- **If resources are not sufficient to cover needs,** then the individual can anticipate a shortfall, and may need to consider some combination of actions to have enough resources in retirement, including increasing retirement resources prior to retiring, reducing their standard of living in retirement, or retiring at a later age.

This analysis does not include all assets individuals may have set aside for retirement, and it does not reflect every possible retirement need. Even so, this study provides a reasonable way to evaluate how effectively current employer-sponsored benefits and Social Security might financially prepare public employees to have adequate retirement income throughout retirement.

### General Employee Data and Assumptions

Retirement needs and resources are calculated individually for each representative person in the study. The analysis examines a wide, representative array of general employees at a large U.S. public plan sponsor. *Table 1* captures the average key inputs for the general employee data used in the analysis.

**Table 1: Average General Employee Data**

<table>
<thead>
<tr>
<th>Average:</th>
<th></th>
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<tbody>
<tr>
<td>Age</td>
<td>39</td>
</tr>
<tr>
<td>Service</td>
<td>13</td>
</tr>
<tr>
<td>Limited 2019 Pay</td>
<td>$50,000</td>
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<tr>
<td>Average Account Balance</td>
<td>$110,000</td>
</tr>
</tbody>
</table>

Below are the assumptions used in the development of the results that follow (*Table 2*). The assumption descriptions denoted by an asterisk (*) are used for sensitivity analysis in some results, such as +/-1% on returns and 80th percentile mortality experience.

### Table 2: Baseline Scenario Assumptions

<table>
<thead>
<tr>
<th>Baseline Assumption</th>
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<tbody>
<tr>
<td>Retirement age</td>
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<tr>
<td>Preretirement investment rate of return</td>
</tr>
<tr>
<td>Postretirement investment rate of return</td>
</tr>
<tr>
<td>General inflation</td>
</tr>
<tr>
<td>Medical inflation</td>
</tr>
<tr>
<td>Pay growth</td>
</tr>
<tr>
<td>National wage base increase rate</td>
</tr>
<tr>
<td>Postretirement mortality</td>
</tr>
<tr>
<td>Defined Benefit plan discount rate (used to develop cost equivalent DC plan)</td>
</tr>
</tbody>
</table>
Two baseline plan designs were constructed to model in the analysis: one DB plan and one cost-equivalent DC plan. The specific features of the baseline design are displayed in Table 3.

The baseline design represents a typical DB plan for a general employee. The DB plan features a 2 percent multiplier based on five year Final Average Earnings (FAE). Other categories of public employees, such as teachers, firefighters, and police officers, may have features of their DB plan that differ from this one and some of these features are considered in alternative plan designs. Three aspects of this baseline model should be noted. First, there is no COLA in the DB plan. Second, the covered employees participate in Social Security. Third, there is retiree medical coverage.

Alternative plan designs also were modeled and will be discussed later in the paper. The purpose of these alternative designs was to capture the impact of growing trends in the public sector retirement space on participants' retirement income adequacy.

The first alternative scenario modeled was a DC plan designed to be considered a "cost-equivalent" replacement for the baseline DB plan using the 6.5 percent conversion assumption detailed in the Assumptions section. To determine the cost-equivalent benefit, a series of normal cost (the annual cost attributable to a year of service within a pension plan) calculations were completed for an average participant and then converted to a percent of payroll. The employer contribution level was selected assuming the employee would continue to contribute the same amount as under the baseline DB model. It should be noted that this calculation is highly sensitive to the underlying conversion assumption. An alternative design assuming a seven percent conversion assumption is analyzed later in the paper.

An additional alternative design modeled was one in which the plan participants do not participate in Social Security like many public safety employees. In this scenario, the multiplier for the DB plan was increased from 2.0 percent to 2.5 percent and the employee contribution increased from 6 percent to 7.5 percent.

Finally, additional scenarios were analyzed regarding more ancillary benefits related to the baseline DB design. One scenario examines the impact if the covered employees did have a COLA, set at 1.5 percent, as part of the baseline DB plan design. Furthermore, the impact of not having a retiree medical plan was calculated.
III. FINDINGS

Retirement Readiness - Typical Public Sector Plan for General Employees

The model used in this analysis calculates target needs at retirement as 20.8 times final pay as the average for general employees at an age 62 retirement (Figure 1). Under the baseline scenario, the DB plan, along with Social Security and the retiree medical plan, would provide annuity resources of 18.7 times final pay, on average, at age 62. The annuity resources break down as follows: the DB plan covers 10.3 times final pay; Social Security covers 5.1 times final pay; and retiree medical covers 3.3 times final pay.

This results in a shortfall of needs of 2.1 times final pay that the average employee would need to cover through other resources. If the average employee saved an additional four percent of pay over their career, perhaps in a supplemental DC plan, that would be sufficient to cover the shortfall.

There are other ways to make up the shortfall. Changing the multiplier in the DB plan from 2 percent to 2.5 percent would cover the residual needs. Adding a 2 percent COLA to the baseline DB plan also would make up the difference. The plan sponsor could pursue both of these approaches by increasing the multiplier to 2.25 percent and adding a one percent COLA. Any of these adjustments would be enough for the covered employee to meet their total needs in retirement.

Retirement Readiness - Cost Equivalent DC Design for General Employees

A general employee working his or her full career participating in the cost-equivalent baseline DC plan design faces a much greater shortfall of needs in retirement when the employee and the employer are each assumed to be contributing six percent of pay. The baseline DC plan provides only 6.6 times final pay in resources (Figure 2). This amount, combined with the resources from Social Security and retiree medical, leaves a shortfall of needs of 5.8 times final pay. If the employee saved an additional 11 percent of pay over their career, in addition to the six percent already being contributed, that would be sufficient to cover the shortfall. Total contributions to the DC plan would need to total 23 percent - 17 percent from the employee and 6 percent from the employer - to provide sufficient retirement resources at age 62.

Raising the employer contribution to 13 percent of pay would make the adequacy of the DC plan comparable to the baseline DB plan, but as discussed above, this would still leave a small shortfall of needs that the employee would need to meet through additional savings, delayed...
retirement, or a lower standard of living.

The cost equivalence between DB and DC plans often is discussed by plan sponsors when considering what type of plan to offer or whether to make changes to an existing plan. The DB plan in the baseline scenario uses a 6.5 percent discount rate and this discount rate was used to create the cost-equivalent baseline DC plan. If the DB plan discount rate was set at seven percent, the current median discount rate among public plans in the U.S., the employer contribution rate for the DC plan drops to four percent (rather than six percent) while remaining “cost-equivalent” to the DB plan. In this scenario, the shortfall of needs in the DC plan increases by 1.1 times final pay since less is being contributed to the DC plan (Figure 3). This cautions against focusing solely on employer cost without considering the impact on employee retirement preparedness when making plan design decisions.

**Figure 3: Cost-Equivalent DC Plan with a 7% Discount Rate Results**

There are two primary reasons the cost equivalent DC plan in these examples falls short of providing the retirement income that the DB plan provides. The first reason is that the study assumes that the employer can earn a 6.5 percent or 7.0 percent expected return and thus uses that as the discount rate or conversion rate. In contrast, the study assumes a participant can only earn a 6.0 percent expected return. Secondly, the accrual of benefits in a final average DB plan increases at the end of a participant’s career, unlike the DC plan which accrues evenly across a career. Comparing the DB and DC plans mid-career would result in a more similar benefit being provided. Comparing the DB and DC plans early-career would result in the DC plan providing a higher benefit to the participant. These benefit comparisons become even more complex if we consider employees who move between jobs with different types of benefits throughout their career. However, in this analysis we are focused on income at retirement age, another factor which plan sponsors can consider when analyzing the impact of plan changes.

**Gender**

*The Real Deal* research describes five levels of retirement readiness based on surplus or shortfall as a multiple of pay: significantly below target (more than four times pay shortfall), below target (between two times pay and four times pay shortfall), just below target (within two times pay shortfall), just above target (within two times pay surplus), and above target (more than two times pay surplus). Both men and women participating in the baseline DB plan find themselves falling below target. More than half of women and men are “below target,” 58 percent and 51 percent respectively, with an additional three percent of women and one percent of men “significantly below target” (Figure 4).

Among women in the baseline DB plan, 34 percent are “just below target” and only five percent are “just above target”; none are “above target.” For men, the same percentages are 42 percent and six percent respectively, with no men “above target” either. While these numbers are more encouraging than the numbers for DC plan participants discussed below, it still suggests that pension plan participants should not expect their DB plan to meet their full needs in retirement. Some amount of personal savings will be necessary for most retirees, in addition to Social Security, the pension, and retiree medical benefits.

The situation is more dire for those in the baseline DC plan. An overwhelming 92 percent of women and 85 percent of men are “significantly below target”. An additional seven percent of women and 14 percent of men are “below target” and a mere one percent each of women and men are “just below target.” While these employees will receive annuity resources from Social Security and retiree medical, their DC plan, at this level of contributions, is anticipated to be insufficient to meet their needs in retirement. As discussed above, a significantly higher contribution on behalf of either the employee or the employer could close much, if not all, of the shortfall of needs for DC plan participants.

Women fall below target more than men for a few reasons. Since women live longer than men, on average, they have more years of retirement to finance, which requires more
resources at retirement to achieve the same standard of living. Those additional years of retirement also mean that the value of their retirement resources is eroded by inflation more than men's resources. Relatedly, women often face greater healthcare costs, again because they live longer and have more years to potentially manage late-life health conditions or to cover long-term care costs at advanced ages. Women experience a steep decline in income past age 80, a decline not experienced by men of the same age.\(^7\)

The results from this model assume women have similar work experiences as men in terms of career trajectory. However, the data used in the study reflects women have slightly lower earnings than men. Furthermore, as prior National Institute on Retirement Security (NIRS) research has noted, external factors also impact the retirement security of women.\(^6\) For instance, taking time out of the workforce for caregiving work can affect one's retirement preparedness and it is more often women who take on these additional responsibilities. Divorce can also disproportionately impact women's financial situations, and the timing of divorce seems to matter. These external impacts are not modeled here, but on a case-by-case basis can play a significant role in impacting retirement outcomes.

### Results by Gender

**DB Design**

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<thead>
<tr>
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<th>Below Target</th>
<th>Above Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td>3%</td>
<td>58%</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>1%</td>
<td>51%</td>
</tr>
</tbody>
</table>

**DC Design**

<table>
<thead>
<tr>
<th></th>
<th>Below Target</th>
<th>Above Target</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Female</strong></td>
<td>92%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>85%</td>
<td>14%</td>
</tr>
</tbody>
</table>

### Results by Income and Age

This analysis also considered retirement preparedness as a function of both age and income. Figure 5 shows the results for the baseline DB plan. Generally, older and lower-income employees are more likely to be close to target, while younger and higher-income workers are more likely to be below target, often significantly so. Social Security's progressive formula provides a higher replacement rate to lower-income workers, so they are more likely to have the annuity resources necessary to meet their needs in retirement. Also, those closer to retirement today will avoid the years of continually rising healthcare costs that will be faced by younger workers in The Real Deal model. Furthermore, lower-income workers, almost by definition, will require fewer resources at retirement because they have smaller preretirement incomes to replace. The combination of Social Security and a DB pension does much to replace these low incomes.
Somewhat surprisingly, then, it is the oldest, lowest income workers who have the highest surplus, at 1.1 times pay, whereas it is the highest income workers in their early 30s who have the greatest deficit, at 6.3 times pay. These young, but already high-income workers are expected to receive a lower replacement rate, and, therefore, fewer annuity resources from Social Security, while they will have to replace more of their high incomes via their pension plan and personal savings. Also, they are projected to face years of rising healthcare costs that have been outpacing increases in wages, whereas the workers in their 60s will face fewer years of that. Finally, those workers in their 30s today are expected to live longer than workers in their 60s today, and those additional years mean more time for inflation to erode the value of retirement resources. These factors make it more difficult for younger workers to reach their retirement income target. In reality, many of those high-income workers likely will have private resources to meet their needs in retirement, but it is incumbent upon them to save over the course of their career.

Examining the results by generation reveals the same trends as noted above. The majority of younger workers are “below target” while the majority of older workers are “just below target” in the baseline DB scenario (Figure 7). Very small numbers of workers in their 50s and 60s are above target, while six percent of workers in their 30s are “significantly below target.” The DC plan results show nearly all employees in their 20s, 30s, and 40s are significantly below target, while nearly three-fourths of workers in their 50s and half of workers in their 60s fall significantly below target (Figure 8).

The model presented here assumes that the same benefits will be offered to all workers, regardless of age. In practice, nearly all state and local government plan sponsors have adjusted benefit levels and plan provisions in the years since the Great Recession. Most of these changes protected current retirees and only affected future workers (though some did impact current employees). Regardless of the impact to current active workers and retirees, almost all of the policies aimed at reducing benefits and costs will affect future workers, who are expected to be most impacted by the key retirement trends of longer lives and higher health costs.

In the baseline DC plan, nearly everyone is significantly below target (Figure 6). Save for a relatively small number of mostly low-income, somewhat older workers who are merely “below target”, all other age and income cohorts are falling significantly behind. The young, already high-income workers have a shortfall of 9.9 times pay in the DC plan.
changes will diminish expected retirement income by lowering benefit levels, reducing postretirement COLAs, or changing retirement eligibility, e.g., by raising the retirement age. While many of these changes were implemented to reach plan cost targets, it is notable that the workers most impacted by benefit reductions are more likely to be from younger generations that are expected to face higher retirement needs relative to their pay levels.

**Additional Scenarios**

**High Return and Low Return Scenarios**

Investment return is an important input in the valuation and management of both DB and DC plans. The investment risk is borne by plan sponsors in the DB plan and by employees in a DC plan. From an employee’s retirement income adequacy perspective, sensitivity around returns is more important in a DC plan. Regardless of the return achieved by a DB plan, an employee can expect underlying annual income from the pension to remain unchanged. This is also true of the retiree medical and Social Security benefits modeled.

The Real Deal for the Public Sector analysis considered two alternative scenarios related to investment returns. The baseline model assumes a preretirement investment rate of return of six percent and a postretirement investment rate of return of five percent. Alternative scenarios were modeled in which pre- and postretirement returns were seven and six percent (high return) and five and four percent (low return), respectively.

The shortfall of needs in the DC plan is lower in the high return scenario and greater in the low return scenario. This is intuitive since the only input more impactful to DC resources at retirement than investment return is the savings rate itself. The shortfall of needs under the DC plan in the high return scenario decreases from 5.8 times final pay to 3.3 times (Figure 9). On the other hand, the shortfall increases to 8.3 times pay in the low return scenario.

Within the DC plan, the individual is taking on the risk of investment returns. The exposure to this level of volatility poses a risk to the retirement security of individuals saving in a DC plan. Employers choosing to pass along this risk to employees may consider increasing the benefit level to account for the transfer of the risk. Timing also matters when it comes to retirement for a worker in a DC plan. A worker could dutifully save over the course of their career, but if the economy enters a low return period as that worker approaches retirement, they could fall behind if they are in a DC plan.

It is worth pointing out another intricacy revealed in the analysis. Total needs, not just the shortfall of needs, actually decrease in the high return scenario while they increase in the low return scenario. This is because the analysis is based upon the assumptions detailed in Table 2. Higher returns reduce total needs at retirement since more retirement income is generated through investment earnings. Additionally, the impact of both regular and
medical inflation is lessened because higher returns do more to counteract inflation.

Put another way, the value of the needs does fluctuate depending on the investment return used because the multiple of pay is calculated using the present value of the stream of necessary income. A higher rate of return will lead to a lower present value, and vice versa for the low return scenario. The same is true for any annuity resources modeled, such as retiree medical and Social Security benefits. The annual resource does not change between return scenarios, but the present value of the resource does.

Longer Lifetime

This analysis also considered the impact of people living longer. The baseline scenario for both plans assumes the 50th percentile of life expectancy, which is approximately age 90 for females and age 88 for males. This research also examined the impact of assuming the 80th percentile of life expectancy, which is age 98 for females and age 96 for males. As one would expect, total needs and the shortfall of needs increase under both plans in the longer lifetime scenario. Total needs grow to 25.1 times final pay (Figure 10). This is the highest level of total needs examined under any of the

Figure 9: Cost-Equivalent DC Plan - Alternative Return Scenarios

Figure 10: Comparing DB and DC Plans Shortfall - Longer Lifetime Scenario

Additional employee savings to cover shortfall

4%  6%  11%  15%
scenarios in this analysis, indicating the very real impact longevity can have on retirement income adequacy.

Under the DB plan, the shortfall of needs increases from 2.1 times final pay to 3.4 times, while in the DC plan, the shortfall rises from 5.8 times to 8.2 times. Retirement resources in the DB plan increase as more years of benefits are paid, however the DB plan benefit does not increase with a COLA to cover inflationary increases in the later years. Retirement resources generated by the DC plan are the same in both the baseline scenario and the longer lifetime scenario because greater longevity in retirement has no effect on the savings generated through a DC plan during one’s working years. In practice, this means a long-lived retiree will either need to reduce their standard of living to make their DC savings last throughout retirement or run the risk of outliving their savings.

Public DB plans are able to pool longevity experience among all plan participants to provide annuity payments for a lifetime. This is much more difficult to address in individual-based savings programs. Individual savers are not able to plan for exactly how long they will live. Experience pooling allows the DB plan sponsor to bear the longevity risk for the plan members, a risk that is completely carried by individual DC plan participants.

No Social Security

Slightly more than a quarter (28 percent) of all public pension participants nationwide do not participate in Social Security. The Real Deal for the Public Sector examined the effect of non-participation for both DB and DC plan members. The design modeled for DB plan members shifts from a multiplier of 2.0 percent to 2.5 percent and the employee contribution increases from 6 percent to 7.5 percent. This is not intended to be a cost equivalent design to the DB plan with Social Security, but rather to represent a typical DB plan without Social Security. Under this design, DB plan members see their shortfall of needs triple from 2.1 times final pay to 6.5 times without Social Security (Figure 11). And 97 percent of non-Social Security DB plan members are significantly below target in terms of retirement preparedness.

The analysis also considered what would happen if the money saved by not paying the 6.2 percent FICA payroll tax was contributed by the employer to the DB plan. In essence, this maintains the same cost to the sponsor as the baseline DB plan, just without Social Security participation. The resulting design has a multiplier of 3.2 percent. The shortfall of needs still rises, but from the baseline DB plan’s results of 2.1 to 2.9 times final pay, with more than a quarter of plan participants just below or just above target.

A similarly cost equivalent DC plan without Social Security would mean the employer puts the 6.2 percent savings from not paying the FICA tax into the DC plan, for an employer contribution rate of 12.2 percent. Under this design, the shortfall increases dramatically from the baseline DC plan’s results of 5.8 to 8.5 times final pay. Also, 100 percent of those plan members are significantly below target.

If an employee not participating in Social Security also chose to save the additional income from not contributing to FICA in a defined contribution plan, their shortfall (either of 2.9 times pay under the DB plan or 8.5 times pay under the DC plan) would decrease by 3.5 times pay. These employees will have additional accumulated savings to help offset retirement expenses.

The DB plan expected surplus of 0.6 times pay when the employer and employee cost are the same as in the baseline DB plan may seem counterintuitive. The results highlight
the impact of the progressive nature of the Social Security benefit and differences in the underlying assumptions of what Social Security benefit can be provided through FICA tax funding. Employees making above a certain threshold will have more replaced by an employer sponsored plan as compared to Social Security.

Age 55 Retirement

It is common to see retirement ages even earlier than 62 in the public sector, particularly for public safety employees. It is also more common in public safety plans for participants to not be covered by Social Security. A common retirement age considered for these public safety employees is age 55. However, retiring earlier means less time to accumulate resources and more time in retirement spending those more limited resources. This effect leads to an even greater shortfall for participants at age 55 (Figure 12) under both the baseline and no Social Security designs in this analysis. The results in Figure 12 are modeled from a strawman of an average male under the baseline and no Social Security plan designs and assuming age 55 retirement.

Figure 12: Baseline DB Plan - Impact of Retiring at Age 55

The retiree medical benefit modeled in this analysis makes up a particularly large portion of the total resources at age 55 (4.0 times pay under both scenarios), since medical costs are particularly expensive before Medicare eligibility at age 65. The impact of removing Social Security coverage at age 55 is less significant as a multiple of pay as compared to age 62 retirement because the earliest age employees are able to access Social Security is 62. Still, the design without Social Security is not rich enough to compensate for the lack of Social Security for the average participant. If sponsors deem it important for participants to retire at age 55, their plan’s benefits will need to be designed with that consideration in mind.

The Benefit of a Cost of Living Adjustment (COLA)

This research also examined the impact of providing a COLA with the baseline DB plan. Total needs as a percentage of final pay increase over the course of retirement. As these needs rise, the shortfall of annuity resources grows. However, including a 1.5 percent COLA dramatically reduces the shortfall of needs.

Total needs as a percentage of pay at retirement increase to 148 percent at age 86. Under the baseline DB plan, annuity resources at age 86 are 98 percent of pay at retirement, leaving a significant shortfall. However, when a COLA is added to the baseline DB plan, the annuity resources at age 86 are 122 percent, cutting in half the shortfall of needs (Figure 13). As a multiple of pay at retirement, the total shortfall of needs declines from 2.1 times pay (baseline) to 0.4 times pay (1.5 percent COLA).

Inflation levels have been much lower than historical norms in the period following the Great Recession. The expectations of plan sponsors, investment managers, and others changed throughout this period, with the Federal Reserve lowering its inflation target to two percent (and with actual inflation often falling short of that lowered target). Pension funds followed by lowering their long-term expectations, as well.

It is reasonable for public plans to respond to new data by updating their expectations, but there is no guarantee that inflation will remain low in the future simply because it has been low in recent years. Inflation reached five percent in May of 2021 and then continued to climb to levels unseen since the 1980s.

While inflation is not expected to persist at current levels, e.g., 8.2 percent in September 2022, it highlights the challenge of predicting the level of inflation during retirement. Many plan changes to reduce COLA benefits during the past 15 years were premised on the expectation that inflation would remain low for the foreseeable future. Some of these COLA reductions recognized that some plans had fixed COLAs that were providing increases that exceeded actual inflation during the recovery from the Great Recession. Today, the tables have turned for many retirees, with inflation surpassing COLAs, if COLAs are even still offered. A number of plans eliminated COLAs completely.

The value of a COLA is that it prevents the erosion of the purchasing power of a pension benefit. Even at the historically low levels of inflation experienced in the years following the Great Recession, the purchasing power of a
Figure 13: Baseline DB Plan - Impact of a Cost of Living Adjustment (COLA)

Figure 14: State COLA Reductions, 2009-2018
pension benefit still will decline over time, as illustrated in Figure 13 above. The higher levels of inflation seen since the Covid-19 pandemic recession have only exacerbated this challenge.

Given legal protections regarding public pension benefits in many states, it is common for younger generations to be offered a COLA benefit that is lower than what was provided to preceding generations because it is easier to reduce COLA benefits for new hires. In some sense, the COLA reductions reflected changing expectations of future inflation after living through a decade with very low inflation. But the current COLA provisions will not be relevant for a young, recently hired worker for many decades. And there is no guarantee that the low inflation of the past decade will persist during the next 30-50 years, as recent experience has shown. This suggests that plan sponsors may need to reconsider COLA provisions if they are to provide adequate retirement income to future generations of workers.

Lack of a Retiree Medical Plan

The baseline scenario in this analysis assumes that a worker will have access to a retiree medical plan providing benefits equal to 3.3 times pay at retirement. Without access to one of these plans, the shortfall of needs grows to 5.4 times pay (Figure 15). An individual worker can cover this gap by increasing their personal savings by an additional ten percent of pay over the course of their career.

Another way to address this shortfall of resources is to simply increase other annuity resources. For instance, the DB plan could be adjusted to make up for the lack of a retiree medical plan. Changing the DB plan multiplier from two percent to three percent; adding a three percent COLA; or raising the multiplier to 2.5 percent and including a two percent COLA could eliminate the shortfall created by the lack of a retiree medical plan.

The value of a retiree medical plan attests to the impact of health costs during retirement. Older people typically experience a greater number of health conditions that cost more to treat than younger people, which drives costs. Also, medical inflation has long outpaced regular inflation, which disproportionately impacts older people. Thus, any benefit that helps to alleviate health costs increases retirement income adequacy.

Retiree medical coverage and other post-employment benefits offered in the public sector typically enjoy fewer legal protections than pensions, which means it is easier for legislators to cut or reduce retiree medical benefits. This not only weakens retirement income adequacy for retirees in the near-term, but exacerbates the trend discussed throughout this paper of younger workers bearing more of the brunt of plan changes focused on reducing costs. It is worth noting that there is already a great variety of retiree medical offerings from state to state and the majority of public retiree medical costs are concentrated in just ten states.10
IV. UNDERSTANDING THE GAP BETWEEN RETIREMENT RESOURCES & TOTAL NEEDS

Employees in the average public sector DB plan still need to save approximately four to six percent of pay annually on their own for an adequate retirement. While the combination of Social Security, a pension, and retiree medical benefits covers much of an employee’s needs at retirement, that combination alone is not sufficient to meet total needs. If offered a supplemental DC savings plan through their employer, such as a 457 plan, the average public sector employee should strongly consider setting aside additional savings for retirement.

Under all the scenarios studied in this analysis, DC plans provide less retirement income than DB plans for the same cost for career employees. DB plans benefit from professional investment advice, investment risk pooling, and longevity pooling. Final average pay DB plans focus on final retirement income compared to DC plans which allocate retirement income evenly across a career. This leaves many career employees falling behind sharply at retirement age when participating in “cost-equivalent” DC plans.

This research also examined alternative scenarios. One of these scenarios modeled public employees not participating in Social Security, which represents the experience of just more than a quarter of public sector employees. Not participating in Social Security requires a higher multiplier as part of the DB plan and higher employee savings for an adequate retirement. Even with a higher multiplier and additional contributions, the general employee considered still experienced a greater shortfall of needs without Social Security.

The addition of a COLA does much to counteract the effects of inflation on eroding the value of retirement resources. The 1.5 percent COLA modeled and discussed above still leaves a small shortfall of needs under the baseline scenario. Offering a DB plan with a two percent COLA provides employees with adequate retirement income without any additional employee savings. Many public plan sponsors reduced or eliminated COLAs during the past fifteen years, but those decisions were made at a time of low inflation. Now that inflation is rising rapidly, many retirees are seeing the value of their pension benefit decline.

Another alternative scenario considered the impact of not having a retiree medical plan. This increases an employee’s shortfall, requiring an additional 10 percent of pay over an employee’s career to cover the gap. While retiree medical plans often feel ancillary, they are particularly important for sponsors encouraging retirement before Medicare eligibility.

Retirement is growing more challenging for younger generations. Several factors are working against younger employees today. As general longevity is projected to increase, current cohorts of young people are expected to live longer lives than current cohorts of older people. This fact alone requires more savings for retirement. Additionally, rising medical costs mean younger employees are less ready for retirement than prior generations. Younger workers today are expected to face higher medical costs when they reach retirement age as compared to older workers nearing retirement in the next few years. Furthermore, the impact of changes to plan designs and benefit offerings in recent years will be borne disproportionately by younger cohorts of workers, who will participate in tiers of pension plans with less generous benefits.

While this analysis modeled a general employee in the public sector, it is worthwhile to consider some of the implications for employees in plans with compressed working years. Public safety employees, particularly police officers and firefighters, typically have fewer working years and more retirement years than a general government employee, which means more resources are necessary per year worked. A firefighter may only have a twenty year career and then retire from the profession in their late 40s or early 50s. While they are likely to pursue a second career after leaving firefighting, plan sponsors should consider how the baseline DB plan modeled here could be adjusted to provide retirement income adequacy to these categories of workers with fewer working years in a public DB plan.
Key Findings

The following are the key findings from the research relative to retirement income adequacy:

- ‘Your Retirement Number’ is elusive because key factors are individual-based
- Retirement is growing more challenging for younger generations
- Employees in the average public sector DB plan still need to save ~4.0%-6.0% on their own for an adequate retirement
- Rising medical costs have younger employees less ready for retirement than prior generations
- Females are less prepared for adequate retirement than males due to longer life expectancies

The following are the key findings from the research relative to plan design:

- DC plans provide less retirement income than DB plans in a typical “cost-equivalent” conversion for career employees
- The average DB plan with a 2.0% COLA provides employees with adequate retirement income without any additional employee savings in the baseline scenario
- Not participating in Social Security requires a higher multiplier and higher employee savings for an adequate retirement
- Not having a retiree medical plan increases an employee's shortfall, requiring an expected additional 6% of pay over an employee’s career to replace the gap

V. CONCLUSION

Achieving retirement income adequacy should be a key goal for plan sponsors and employees alike. Many public sector employees still have access to a DB pension plan, which provides high levels of retirement income adequacy. But public employees should be aware that their DB plan, in combination with Social Security and a retiree medical plan, may not be enough to meet all of their needs in retirement. Becoming educated about their needs and what retirement resources they can expect from Social Security and employer-sponsored plans is critical for retirement preparedness. Plan sponsors also should understand their plan’s level of retirement readiness for most employees and should encourage employee savings for retirement. Together, plan sponsors and employees can work toward a secure retirement for all.
VI. DISCLOSURES

This analysis is intended to assist with review of typical retirement adequacy for public sector employees, and its use may not be appropriate for other purposes. Experience different than anticipated could have a material impact on the ultimate costs of the benefits or the ultimate benefit provided.

Models are used to calculate the expected retirement income adequacy under deterministic scenarios of an employer’s retirement benefit plans as applied to their current active population.

The model outputs various assumption sensitivities. In practice, certain other assumptions, such as inflation and retirement age, would also be expected to vary when the expected return assumption changes.

The model does not include or address the following items:

- Participant resources outside of the employer’s plan(s)
- Demographic changes to the population modeled
- Changes to expenses after retirement other than savings in the employer’s plan, average taxation changes, and average medical costs. It does not consider that discretionary expenditures may decrease over a participant’s lifetime or increase with long-term care costs.

The retirement actuaries relied on experts at Aon for the development of the capital market assumptions underlying the economic assumptions and also relied on experts for the development of health care assumptions in the projection model.

ENDNOTES

4. Taxation adjustments in retirement vary by individual. The largest decrease in tax rate is observed in the middle-income group. Participants at higher income levels will have more of their Social Security benefit taxed, so they will generally experience a proportionally smaller decrease in taxes than lower-income participants. Conversely, the lowest-income individuals are already in the lowest tax brackets, so the reduction in taxes postretirement is limited.
7. Ibid.
WHO WE ARE & WHAT WE DO

Our Mission
The National Institute on Retirement Security is a non-profit research and education organization established to contribute to informed policymaking by fostering a deep understanding of the value of retirement security to employees, employers, and the economy as a whole.

Our Vision
Through our activities, NIRS seeks to encourage the development of public policies that enhance retirement security in America. Our vision is one of a retirement system that simultaneously meets the needs of employers, employees, and the public interest. That is, one where:

- employers can offer affordable, high quality retirement benefits that help them achieve their human resources goals;
- employees can count on a secure source of retirement income that enables them to maintain a decent living standard after a lifetime of work; and
- the public interest is well-served by retirement systems that are managed in ways that promote fiscal responsibility, economic growth, and responsible stewardship of retirement assets.

Our Approach
- High-quality research that informs the public debate on retirement policy. The research program focuses on the role and value of defined benefit pension plans for employers, employees, and the public at large. We also conduct research on policy approaches and other innovative strategies to expand broad based retirement security.
- Education programs that disseminate our research findings broadly. NIRS disseminate its research findings to the public, policy makers, and the media by distributing reports, conducting briefings, and participating in conferences and other public forums.
- Outreach to partners and key stakeholders. By building partnerships with other experts in the field of retirement research and with stakeholders that support retirement security, we leverage the impact of our research and education efforts. Our outreach activities also improve the capacity of government agencies, non-profits, the private sector, and others working to promote and expand retirement security.
The National Institute on Retirement Security is a non-profit, non-partisan organization established to contribute to informed policy making by fostering a deep understanding of the value of retirement security to employees, employers, and the economy as a whole. NIRS works to fulfill this mission through research, education and outreach programs that are national in scope.