



# PROBLEMS WITH STATE-LOCAL FINAL PAY PLANS AND OPTIONS FOR REFORM

*By Peter A. Diamond, Alicia H. Munnell, Gregory Leiserson, and Jean-Pierre Aubry\**

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## INTRODUCTION

As widely publicized, the financial crisis dramatically worsened the funded status of state and local pension plans. In response, public sector sponsors are making a number of changes. Most of these changes involve increasing employer and employee contributions and cutting benefits for new employees primarily by increasing the age for full benefits. A couple of states have cut cost-of-living adjustments for current retirees, but they are in the process of being sued. One item not on anyone's agenda is reconsidering the basic design of public-sector defined benefit plans.

Defined benefit pension plans for public employees – both here and abroad – almost universally compute benefits based on final pay. That is, employees' initial pension benefits are based on their age at retirement, their years of service, and their average earnings in a small number of years. It is unclear whether the motivation for relying on short periods

of earnings was record-keeping constraints before the age of computers, an interest in relating pre-retirement to post-retirement income in a seemingly transparent way, a desire to reward long-service employees, or some other factor. Whatever the initial motivation, final pay plans suffer from serious shortcomings: they (1) severely “backload” benefits; (2) treat very differently workers on different career trajectories; and (3) invite mischief in terms of sudden late-career promotions. They are also riskier for workers than they appear.

This *brief* proceeds as follows. The first section describes commonly used pension designs. The second section illustrates the consequences of the final pay formula for retirement incentives, different earnings profiles, and late-career salary increases. The third section presents an option for reform based on use of average compensation over the full career and indexation of the earnings history. The final section offers some concluding thoughts.

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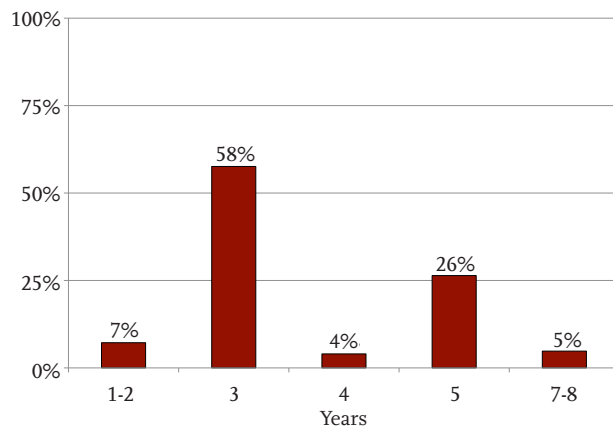
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## THE TYPICAL STATE-LOCAL PLAN<sup>1</sup>

Although state and local defined benefit plans vary enormously across states and between states and localities, they share the same basic structure. They calculate the initial benefit at the full retirement age as the product of three elements: the plan's benefit factor, the number of years of employee service, and the employee's average earnings.<sup>2</sup> The calculation of average earnings is generally based on the three to five years of highest earnings (see Figure 1). Such plans are referred to as final pay plans because the highest earning years are typically the final years in a worker's career.

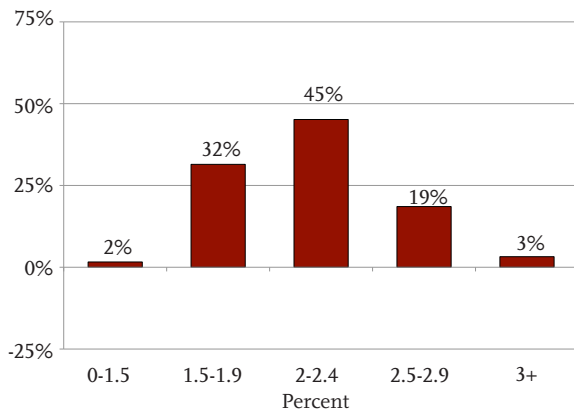
FIGURE 1. DISTRIBUTION OF STATE AND LOCAL PLANS BY YEARS IN AVERAGING PERIOD, 2009



Sources: Center for Retirement Research at Boston College Public Pension Database (CRR PPD) 2009; survey of various annual reports and benefit handbooks; and National Conference of State Legislatures (2010).

Benefit factors for state and local plans are clustered between 1.5 percent and 2.9 percent, with a typical rate of about 2 percent (see Figure 2). Those plans where employees are not covered by Social Security tend to be on the higher side, those with coverage on the lower side. While most states use a single benefit factor, some states increase the benefit factor modestly with tenure. Some plans impose a cap on the replacement rate (benefits relative to pre-retirement earnings), but 60 percent do not.

FIGURE 2. DISTRIBUTION OF STATE AND LOCAL PLANS BY BENEFIT FACTOR, 2009

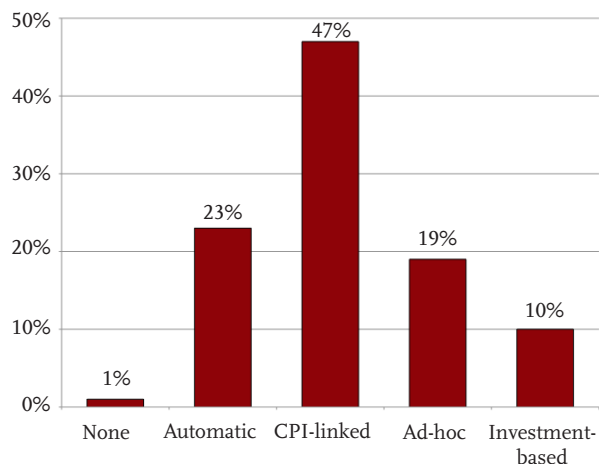


Sources: 2009 CRR PPD; survey of various annual reports and benefit handbooks; and National Conference of State Legislatures (2010).

The age at which participants can claim full benefits generally varies with length of service – for example, age 65 with five years, age 60 with 10 to 20 years, and any age with 30 years of service. Most plans allow early retirement with a reduced benefit. Plans generally do not provide an enhanced benefit for work beyond the normal retirement age.

After the benefit is in payment status, retirees in nearly all plans receive an annual cost-of-living adjustment (COLA). The COLA varies substantially across plans in both the form and generosity (see Figure 3).<sup>3</sup>

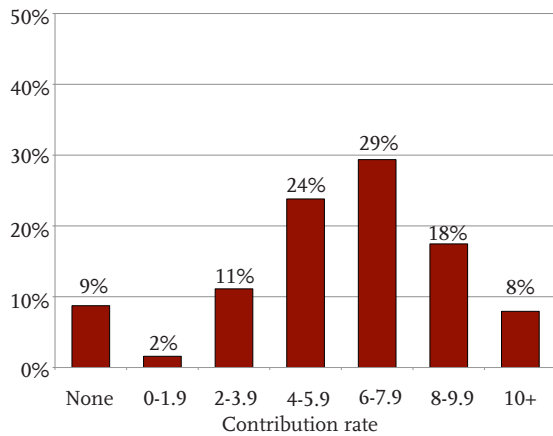
FIGURE 3. DISTRIBUTION OF STATE AND LOCAL PLANS BY COLA TYPE, 2009



Sources: 2009 CRR PPD; survey of various annual reports and benefit handbooks; and National Conference of State Legislatures (2010).

To illustrate the effects of final pay provisions, the following analysis uses a plan with a constant 2 percent benefit factor, a three-year averaging period, a full retirement age of 65, actuarially fair adjustments for early retirement, and a COLA that fully compensates for inflation after the start of benefits.<sup>4</sup> Employees may claim a pension as early as 55, provided they have accumulated at least 10 years of service. No cap is imposed on the replacement rate. Employee pension contributions are 6 percent of salary, the most typical rate found among our sample of plans (see Figure 4).

FIGURE 4. DISTRIBUTION OF STATE AND LOCAL PLANS BY EMPLOYEE CONTRIBUTION RATE, 2009



Sources: 2009 CRR PPD; survey of various annual reports and benefit handbooks; and National Conference of State Legislatures (2010).

Existing final pay plans have elements not captured by this representative plan, such as staggered eligibility for progressively more generous pensions and less than actuarially fair reduction for early retirement. Nevertheless, the model adopted delineates the major problems associated with a final pay plan.<sup>5</sup>

### PROBLEMS WITH FINAL PAY PLANS

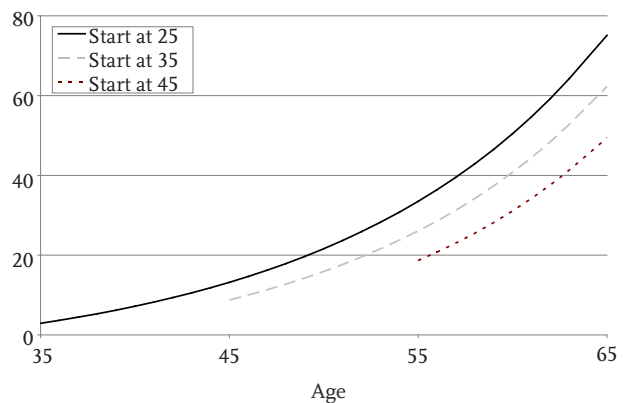
The final pay formula severely backloads benefits, rewards those who enjoy rapidly rising earnings, and creates an incentive for mischief in terms of late-career salary increases.

### BACKLOADING OF BENEFITS

Participants in a final pay plan earn most of their benefits in the last few years of employment, which means that they face a very strong incentive to keep working until full benefits are available.<sup>6</sup> A full career in the public sector may be optimal for both the employer and the employee in some situations, but in other instances shorter periods of employment may be more desirable from the perspective of both parties. For example, social workers, who face burdensome caseloads and constant stress, are often exhausted long before retirement age. These workers need to move to a new job in either the public or private sector. Therefore, a plan that disproportionately rewards long-service workers does not provide the right incentives in all cases.

One measure of the incentive to keep working, along with the level of earnings, is the change in the present value of the promised pension benefit from an additional year of work less the pension contribution relative to the gross salary.<sup>7</sup> As shown in Figure 5, net pension accruals relative to salary increase markedly throughout a worker's career and particularly at older ages.<sup>8</sup> At age 35, a worker who began working for the government at age 25 for a salary of \$30,000 earns a gross salary of \$46,589.<sup>9</sup> The value of the employee's future pension benefits increases by \$4,158 from working to age 36, but contributions of \$2,795 are deducted from his paycheck. Thus, on net, the pension system increases total compensation above the quoted salary by \$1,363, or 2.9 percent. In contrast, at age 55 his salary is \$112,360, and the value of the pension accrual is \$44,359. Contributions are only \$6,742, so the pension system increases compensation by \$37,618, or 33.5 percent of wages. Thus, final pay plans are extremely backloaded.

FIGURE 5. INCREASE IN LIFETIME PENSION BENEFIT AS A PERCENTAGE OF ANNUAL EARNINGS

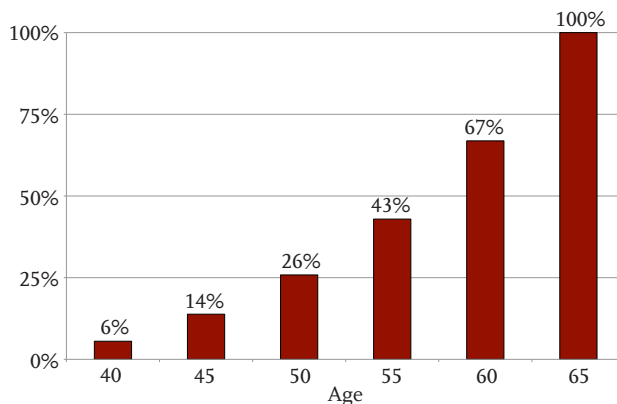


Source: Authors' calculations.

Moreover, employees who have equal tenure are affected differently by the pension system based on their age. Workers who have the same experience receive larger compensation additions at older ages. For example, the worker described above who has 10 years of experience at age 35 receives net pension credits equal to 2.9 percent of gross salary. If the worker has 10 years of experience at age 45, the pension system adds 8.8 percent. At 55, the pension system adds 18.6 percent to the salary.

While a pay schedule involving a reasonable amount of backloading of deferred compensation may be appropriate to motivate and retain employees, a final pay system results in most of the pension benefits being awarded to long-service employees, with workers who leave early getting very little. As shown in Figure 6, an employee who has a 30-year career will earn about one-third of lifetime pension benefits in the last five years of employment; those leaving with 10 years of service receive about 14 percent of the possible lifetime benefits.<sup>10</sup>

FIGURE 6. PERCENT OF LIFETIME PENSION BENEFITS EARNED OVER AN EMPLOYEE'S 30-YEAR CAREER, STARTING AT AGE 35



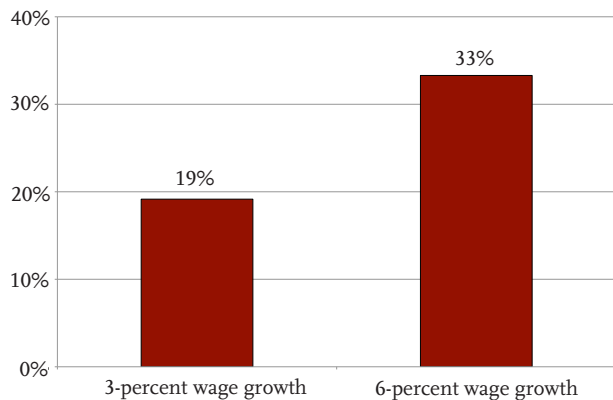
Source: Authors' calculations.

#### IMPACT OF RATE OF EARNINGS GROWTH

Backloading leads to an unequal distribution of benefits by age and tenure, but final pay pensions distribute benefits unequally along other dimensions as well. Because a final pay formula links pension benefits only to compensation at the end of the career, it redistributes between workers whose earnings grow at different rates throughout their careers. The 4.5-percent growth rate assumed to this point results

in a pension value of 25.7 percent of accumulated salary for an individual who works from 25 to 65. However, an employee who has a constant earnings growth rate of only 3 percent over the same 40-year career would receive a pension value of 19.2 percent of lifetime salary. An employee who has more rapidly rising earnings (6 percent) would receive benefits equal to 33.3 percent of lifetime earnings (see Figure 7).

FIGURE 7. LIFETIME PENSION BENEFIT AT AGE 65 AS A PERCENTAGE OF ACCUMULATED EARNINGS, BY WAGE GROWTH



Source: Authors' calculations.

Those employees who have the more rapid earnings growth tend to be the higher paid so, in percentage terms, a final pay plan provides greater pension rewards to higher paid employees relative to the lower paid.<sup>11</sup>

#### INCENTIVES FOR 'PROMOTION'

In similar fashion, a worker who receives a promotion in his final years of employment will receive a much larger pension than a worker who does not. If an employee is promoted to a position of greater managerial responsibility at age 60 that is accompanied by a 20-percent pay raise (rather than the 4.5-percent trend), his lifetime salary will be only 2 percent greater than it would have been without a promotion, but his initial pension benefit is now 15.5 percent larger. Thus, the total value of a late promotion or sudden salary increase is roughly three times as valuable as the pay raise itself.

Instances of suspicious salary increases in the years just prior to retirement are all too common. In Illinois, a police sergeant of the Village of Steger

police department took a 25-percent pay increase in pensionable earnings on the condition of immediate retirement. He worked one full day and then retired at the increased pay rate. Illinois courts eventually ruled against awarding the pension benefit at the increased pay rate.<sup>12</sup> In Northern California, a retiring chief of fire for Orinda and Moraga municipalities earning \$186,000 was granted an increase in his salary largely by enabling him to sell unused vacation days and holidays. That helped boost his annual pension to \$241,000.<sup>13</sup> In Boston, pension spiking was so rampant that it prompted a federal investigation. More than 100 Boston firefighters claimed career-ending injuries while they were filling in for superiors at higher pay grades, enhancing their tax-free disability pensions by an average of \$10,300 a year.<sup>14</sup> About 40 percent of state and local plans in our sample have introduced “anti-spiking” provisions, limiting the amount of a pay raise that counts for pension calculations, to prevent this type of pay boost immediately before retirement.

Without such a provision, which can create administrative difficulties of its own, the incentive to inflate late-career pay is very strong in final pay plans.

In short, the final pay formula provides pensions that produce excessively backloaded benefits that favor workers with rapidly rising earnings, and that produce an enormous payoff to salary increases in the final years of employment.<sup>15</sup>

## OPTIONS FOR REFORM

Defined benefit plans could move away from reliance on final pay in a number of ways. One approach adopted in the private sector is to shift to a cash balance plan. As in traditional private-sector defined benefit plans, the employer makes the contributions, owns the assets, selects the investments, and bears the risk. The employer typically contributes 4 or 5 percent of the worker’s pay to a “notional” account and provides an interest credit (generally based on U.S. Treasury securities) on the balances. Employees receive regular statements and generally withdraw the balance as a lump sum when they retire or terminate employment.

Another alternative to a final pay plan is a defined benefit plan that bases benefits on some measure of career earnings. Of course, a career average system would require some indexing procedure so that earnings early in life are restated in units relevant at retirement.<sup>16</sup> Thus, indexed career average plans and

cash balance plans can be viewed as similar on the accumulation side. A cash balance plan adds up each year’s earnings weighted by the cumulative interest credited, while a career average plan follows the same procedure but the weighting is based on either the growth in prices or wages. The two types of plans differ on the distribution end. Cash balance plans generally pay a lump sum, while state and local defined benefit plans pay a lifetime benefit so individuals are not exposed to the risks of changes in life expectancy or interest rates or outliving their lump sum benefit.<sup>17</sup>

One example of a movement away from a final pay plan for public employees has occurred recently in the United Kingdom.<sup>18</sup> In 2007, the British government closed its final pay plan for civil service employees to new hires and replaced it with “nuvos,” a career average salary plan.

To illustrate the workings of the career average formula, this *brief* considers a stylized version of the “nuvos” pension scheme. Earnings at each age are

adjusted for inflation so that earlier earnings are restated in terms of purchasing power at retirement. The average earnings computa-

tion then uses the entire adjusted earnings history for each individual rather than a fixed number of years. The benefit factor for the stylized version of the plan is 2.43 percent. This value was selected so that an individual working from 25 to 65 has the same pension benefit in the final average salary and career average salary plans analyzed in this *brief*. Being more generous to earlier retirees, this stylized nuvos plan would cost more than the stylized final pay plan, so the focus is on relative benefits, not absolute benefits.

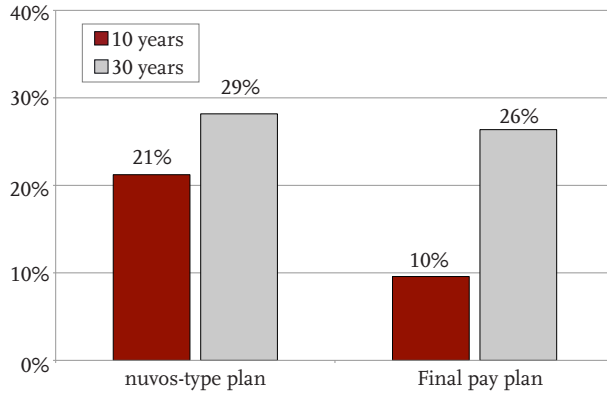
An indexed career average system changes several outcomes. First, a system that adjusts earnings histories for inflation sharply reduces the age-induced backloading in the plan. As a result, younger workers who leave early would receive relatively larger benefits. As shown in Figure 8 on the next page, accumulations as a percent of covered earnings are very similar for a worker who has 10 years of service and one who has 30 years of service. This pattern contrasts sharply with final earnings plans in which benefits as a percent of earnings for early leavers are only a fraction of those for career employees. This shift could be attractive if states and localities were trying to attract young employees with improved education but were unable to adjust earnings because of age. More generally, given the need for both short- and long-career employees, greater uniformity is likely to provide better balance of attraction and retention incentives.

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*One reform option is to move  
to a career average approach.*

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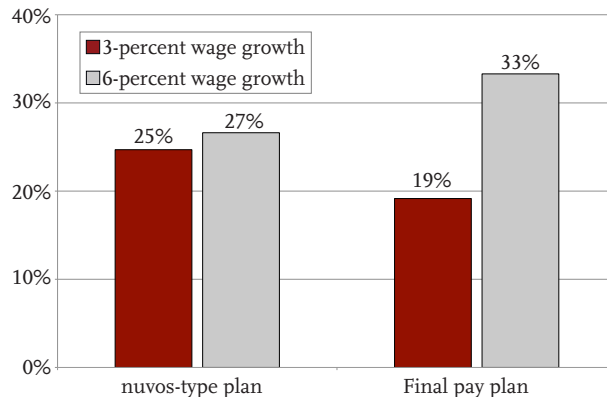
FIGURE 8. LIFETIME PENSION BENEFIT AS A PERCENTAGE OF ACCUMULATED EARNINGS FOR WORKER STARTING AT AGE 35, BY TENURE



Source: Authors' calculations.

Second, a career average system largely eliminates the bias in favor of those who have rapidly growing earnings, who, as noted earlier, tend to be the higher paid. As shown in Figure 9, the lifetime pension benefit as a percentage of lifetime earnings is virtually equivalent for the low and high earner. This outcome contrasts sharply with the much greater reward for those who have rapidly rising earnings under a final earnings plan.

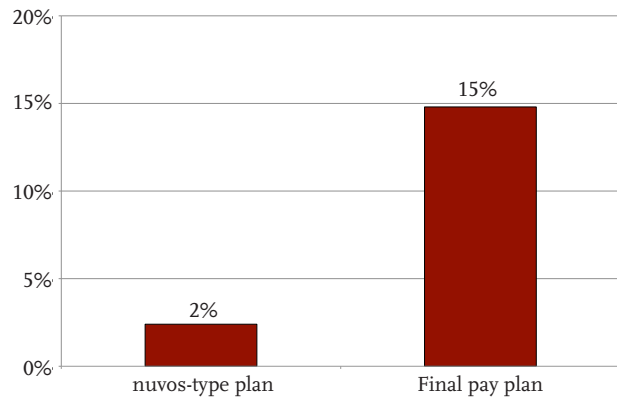
FIGURE 9. LIFETIME PENSION BENEFIT AS A PERCENTAGE OF LIFETIME EARNINGS, BY RATE OF WAGE GROWTH



Source: Authors' calculations.

Third, an indexed career earnings plan such as nuvos eliminates the excessive incentive for late-career salary increases. As shown in Figure 10, a 20-percent increase in salary in the last three years of a career increases lifetime pension benefits by only 2 percent under an indexed career average plan compared to 15 percent under a three-year final pay plan. Such a small increment provides little incentive for either the employer or employee to distort career patterns and personnel priorities.

FIGURE 10. PERCENT INCREASE IN LIFETIME PENSION BENEFITS RESULTING FROM 20-PERCENT INCREASE IN FINAL THREE-YEAR SALARY



Source: Authors' calculations.

In short, an indexed career average design would eliminate many of the most serious problems associated with a final pay plan. Necessarily, such a reform – done with no change in total cost – would affect different workers differently. Individuals who leave government employment at young ages or who experience slower than average earnings growth would do better under a reformed system. Employees who receive a late promotion or, for any other reason, work at widely varying earnings rates during their careers lose relative to the current system. But from the perspective of workers uncertain about their future career paths, the reformed system would represent less risk and so, most likely, be welcome.

With the elimination of some of the undesirable features of final pay plans, other provisions, such as anti-spiking rules, would no longer be required. The reform could also be used to get rid of other idiosyncrasies that produce erratic incentive patterns, as documented in the studies cited earlier.



## CONCLUSION

Pension debates have understandably been focused on generosity and degree of funding. It is also important to address the details of benefit formulas. Short, fixed-window, unadjusted average formulas have been a pervasive feature of both the public and private sector pension landscape in the United States. However, these formulas lead to undesirable effects on the relationship between total compensation and gross salary, distribute benefits across workers in a capricious fashion, provide little for employees who leave early, and create an incentive for earnings manipulation and expensive late-career promotions. In the private sector, a number of plan sponsors have shifted to cash balance plans. Many advantages of such a shift could be gained in the public sector by averaging earnings over the full career and adjusting the earnings history for inflation.

## ENDNOTES

- 1 The federal government's civilian and military pension plans are similar in nature to the state and local plans reviewed in this section and subject to the same criticisms.
- 2 Nebraska is an exception to this generalization because its state employees are covered by a cash balance plan.
- 3 The COLA is an annual post-retirement increase in the pension benefit designed to help retain purchasing power over time. There are four main types of COLAs: 1) automatic – the increase is a constant percentage or dollar amount that is not tied to the Consumer Price Index (CPI); 2) CPI-linked – the increase is tied to the CPI; 3) ad-hoc – the increase is set by the legislature and revised on an ad-hoc basis; and 4) investment-based – the increase is tied to some financial metric, generally the overall plan funded level or the level of assets in a special COLA fund.
- 4 The calculation assumes 4.5 percent annual earnings growth and 3 percent inflation. See the forthcoming working paper version of this *brief* for treatment of additional features of plan design, including staggered eligibility, various COLA formulas, and percentage reduction for early retirement.
- 5 This analysis focuses on the problems of the average earnings formula at the core of the final pay pension. For an analysis that illustrates other erratic patterns of benefit accrual associated with common features of teacher retirement systems, see Costrell and Podgursky (2009). For an analysis that focuses on one state in detail, see the Technical Appendix to The Final Report of the Special Commission to Study the Massachusetts Contributory Retirement Systems (2009).
- 6 If the plan caps the replacement rate, the strong incentive to continue working stops when the cap is reached.
- 7 Present values in this *brief* are computed using a real interest rate of 2 percent and mortality rates formed as a 50-50 gender mix of the RP-2000 combined healthy tables.
- 8 This calculation is pre-tax; it ignores the role of both income and payroll taxes, as well as promised Social Security benefits, in determining the level of compensation.

9 Calculations in this *brief* are performed using an earnings history with a salary of \$30,000 at age 25, 3 percent annual inflation, and 4.5 percent annual earnings growth. However, the incentive and distribution measures computed are independent of the absolute salary level.

10 Backloading also makes the comparison of compensation across workers with different salaries opaque, makes the cost of employing a worker today depend on past employment, and – in systems with multiple government units that share the cost of the pensions in proportion to years of service – creates a means by which later employers can shift compensation costs to earlier employers. The system also creates a large incentive for employees who left public service at a young age to return to covered public employment for a short period immediately before retirement.

11 Brunello and Comi (2003) and Psacharopoulos (1980) find that those individuals who have a higher education receive higher initial wages and have a steeper earnings profile.

12 Puchalski (2002).

13 *Contra Costa Times* (2009).

14 *Boston Globe* (2008).

15 Moreover, while we have focused on calculations in a determinate environment, workers face significant risks from final pay plans. The excessive pension value of a promotion represents a risk to a worker who may or may not receive a promotion. Employees who are terminated before retirement also face the loss of substantial pension benefits. And periods when inflation rises faster than wage growth, such as the 1970s, can erode the value of pensions even for plans based on a few years of final pay.

16 Such a system is essentially equivalent to a notional defined contribution system with a benefit calculation that does not rely on a mortality calculation for determining benefits at full retirement age and no adjustments over time as mortality changes.

17 Nebraska's cash balance plans differs from those in the private sector in two ways. First, employees as well as employers contribute. Second, the normal form of payment is a single life annuity with five-year certain, payable monthly, although other options include a lump-sum payment.

18 Similarly, in the wake of the 2000 perfect storm, when falling stock returns and falling interest rates hit pension funds, plan sponsors in the Netherlands changed the structure and risk sharing of their quasi-public employer-based supplementary defined benefit plans, which cover 90 percent of workers. Most of the defined benefit plans moved from basing benefits on final earnings to indexed career average earnings. The indexed career average plans are like traditional defined benefit plans in that accrued pension rights are based on an employee's wages and years of service, and contribution rates can be raised in response to a funding shortfall. But benefits are not strictly defined; they are tied to the fund's financial status – and, therefore, investment returns – via the annual indexation factor, which is applied to both the accrued rights of active workers and the benefits of retired workers. For further details, see Kortleve and Ponds (2010).



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## ABOUT THE CENTER

The Center for Retirement Research at Boston College was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future.

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