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WILL SWITCHING GOVERNMENT WORKERS TO ACCOUNT-TYPE PLANS SAVE TAXPAYERS MONEY?

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Executive Summary

The Great Recession sparked a debate over the use of traditional defined-benefit (DB) pensions in states and municipalities across the United States. Critics of these plans used the economic downturn, which strained government budgets and worsened pension finances, to advocate for major changes in public pension systems.

Although benefit cuts, increased employee contributions, and a rebound in stock prices have improved pension fund finances, severe underfunding remains a challenge in places where the problem predated the recession and was the result of lawmakers neglecting to make required contributions over many years.¹ This is helping to sustain the idea that we can no longer afford to provide teachers, police, firefighters, and other civil servants with secure defined-benefit pensions.

Earlier would-be reformers pushed for 401(k)-style defined-contribution (DC) plans prevalent in the private sector. But disastrous results in West Virginia, Michigan, and Alaska have shifted attention to “hybrid” plans, such as cash balance plans, that combine elements of defined-benefit and defined-contribution systems. Advocates of these types of plans say they are a compromise between those who want to maintain traditional pension plans and those who push for a transition to a 401(k)-style system. However, DC and hybrid plans, which can collectively be referred to as account-type plans, fail on three important points:

- **They do not help states save money.** Traditional defined-benefit pensions are more efficient than DC plans and most hybrid plans due to economies of scale, risk pooling, and other factors. Moreover, changing plan type introduces transition costs. Thus, it is not surprising that states that switched to DC and hybrid plans did not save money except to the extent that they simply cut benefits or required workers to contribute more toward their retirement.
- **They create more workforce management problems than they solve.** For example, many cash balance plans provide the biggest benefits to job leavers, promoting high turnover in public-sector jobs, which require a high level of skill and experience.
- **They increase retirement insecurity.** Account-type plans introduced around the country threaten the retirement security of young and old alike. While a well-designed hybrid plan could theoretically help younger workers without undermining the retirement security of midcareer and older workers, none of the plans offered in the current political climate has done so.

These plans are presented as solutions to a pension crisis, but do nothing to address the central problem of significantly underfunded plans: elected officials who have consistently failed to fund promised benefits. Account-type plans introduced in recent years cost taxpayers more,

not less, but advocates such as the Pew Charitable Trusts and the Laura and John Arnold Foundation say they are fairer, cause fewer labor market distortions, promote risk-sharing, and are more transparent.² Specifically, advocates say they redistribute benefits toward younger workers, helping with recruitment, reducing job lock, and improving retirement security for mobile workers; they eliminate discontinuities in benefit formulas that discourage workers from working beyond a certain age; they facilitate risk sharing between taxpayers and workers (and, by extension, between current and future generations); and they make pension funding more predictable.

There is a germ of truth to some of these claims. There is no doubt, for example, that workers with traditional pensions do not accumulate significant benefits when starting their careers—though in practice, neither do most participants in account-style plans. However, DB pensions are flexible and can be designed with the goals articulated above in mind. The fact that they are not offers evidence that they serve other purposes, such as recruiting career-minded workers.

Other claims have not borne out, notably the suggestion that costs of cash balance plans are more transparent and predictable. In fact, cost estimates of cash balance plans rely on many of the same actuarial assumptions as traditional pensions while introducing new sources of uncertainty, such as increased turnover. Even variable interest credits, promoted as a way cash balance plans can share risk between employers and employees, increase the risks workers face without necessarily reducing risks for employers and taxpayers.

More generally, attempts to shift risk from employers to workers by moving workers into account-type plans tend to be inefficient because workers are less able to gauge the value of the benefit and are rationally more risk averse. Public-sector workers have consistently shown a strong preference for easy-to-understand and secure retirement benefits and a willingness to pay for these benefits directly (through employee contributions) and indirectly

(by accepting lower salaries). Thus, a shift to account-style plans is likely to harm recruitment and retention or require offsetting increases in other forms of compensation.

Instead of being fair to workers at different stages of their careers and with different work histories, cash balance plans often provide more valuable benefits to younger workers and job leavers than to older workers and career employees. In an effort to show that these plans can be as generous as the pensions they are intended to replace, advocates have showcased cash balance plans with high interest credits. Perversely, these plans provide the greatest benefit, relative to salary, to young job leavers who are savvy and financially secure enough to leave their savings to accrue interest in the plan. (Fortunately for taxpayers, but unfortunately for these mobile workers, many instead cash out their benefits when they move to new jobs).

Pew and Arnold never claim that account-type plans provide a direct cost advantage to employers and taxpayers. However, since these plans are typically introduced alongside cuts to benefits workers have already accrued, this point is often lost on elected officials and the general public. Since cost savings have strong appeal at a time of budget austerity and cash balance plans are the hot topic in pension debates, this report will focus primarily on cash balance plans' impact on employers and taxpayers. However, it will also consider claims that cash balance and other account-type plans improve workers' retirement security.

Overview: Defined-benefit, defined-contribution, and hybrid plans

This section provides a brief description of four types of employer-based retirement plans discussed in this paper: traditional defined-benefit (DB) pensions, 401(k)-style defined-contribution (DC) plans, and two types of

hybrid plans that combine DB and DC features (two-tier DB-DC plans and cash balance plans).³

Though all four types of plan exist in the private sector, there are differences in how benefits are funded. In the private sector, participation in traditional DB pensions and cash balance plans is automatic and benefits are entirely employer-funded. Meanwhile, participation in DC plans is voluntary and employers typically contribute less than employees, usually through partial matching contributions.

In the public sector, participation in a primary retirement plan of some type is usually automatic and workers typically contribute a fixed share of salary toward their retirement benefits, though there may be additional voluntary contributions to DC plans. In recent years, public-sector workers have been responsible for roughly half the cost of new pension benefits, though there is significant variation across plans (author's analysis of CSLGE and CRR's Public Plans Database 2010; Munnell, Aubry, and Sanzenbacher 2015).

While public-sector employee contributions to traditional pensions and cash balance plans are understood to be fixed in the short run—subject to collective bargaining agreements, for example—employer contributions are variable by design. Employers are responsible for the actuarially required contribution (ARC) minus the employee contribution, where the ARC equals the normal cost of the plan—the estimated cost of funding benefits accrued by workers in a given year—plus or minus any amount needed to amortize an unfunded liability or surplus over a number of years.⁴ However, employee contributions can also be adjusted in response to economic conditions, providing for significant risk sharing between employers and employees. Thirty-five states have increased employee contributions since the Great Recession (NASRA 2015).

To determine the present cost of funding future benefits in traditional pensions and cash balance plans, plan actu-

aries consider many factors, including expected years to retirement, expected returns on pension fund assets, and expected salary growth. Factors that vary by worker are averaged so that the normal cost, and therefore the contribution, is the same percent of salary for all workers.

Traditional defined-benefit pensions

Traditional “final-average-salary” defined-benefit (DB) pensions are the most common retirement plans in the public sector. They are designed to provide retirees and their spouses with stable incomes for as long as they live. Traditional DB plans also include disability insurance, of particular importance to the roughly one in four state and local government workers not covered by Social Security.

A traditional defined-benefit plan promises a specified monthly benefit at retirement based on years of service and salary—usually the highest or final salary averaged over three to five years. For example, a worker who retires at a normal retirement age of 62 might get a benefit equal to 1.5 percent times her years of service times her final salary averaged over the last five years of her career, where 1.5 percent is referred to as the benefit “multiplier,” “factor,” or “accrual rate.” Thus, the pension in this example will replace 45 percent of final average salary after 30 years, with Social Security replacing another 35 percent for a median earner (author’s estimate based on Goss 2014). In plans whose membership includes teachers or general employees with Social Security coverage, multipliers typically range from 1.5 percent to 2.0 percent. In police and firefighter plans and plans whose members are not covered by Social Security, multipliers typically range from 2.0 percent to 2.5 percent (author’s analysis of CSLGE and CRR’s Public Plans Database 2001–2012).

The normal cost of traditional pension benefits takes into account salary projections—how much workers’ accrued service credits will be worth at retirement when multiplied by projected final average salaries. This is done to

average costs across workers and to prevent costs from rising due to an aging workforce. This means a substantial portion of the normal cost is for projected benefits, as opposed to benefits that would be owed if a worker left today. It also means increased employee contributions or slower salary growth can reduce employer costs when assumptions are not met or under adverse economic conditions, as happened in the wake of the 2008 downturn.

The estimated present value of future pension obligations is sensitive to the discount rate used. It is sometimes argued that DB pension benefits are guaranteed and therefore should be discounted to their present value using a low “risk-free” interest rate,^{5} which greatly increases the perceived cost of these benefits (see, for example, Biggs 2012). Though the choice of discount rate depends on the context, it generally makes sense to use the expected rate of return on pension fund assets to discount projected benefits, especially since employers can reduce the cost of these benefits if expectations are not met (U.S. GAO 2014; Morrissey 2011). This is by definition the best estimate of contributions needed to fund these benefits, but does not take into account the investment risk borne by employers and taxpayers. It is appropriate to use the risk-free rate to set an upper bound on the cost to taxpayers of benefits actually owed to workers (excluding the effect of projected salary increases), as will be done later in this report. This is a measure not of expected outlays but of what it might cost to immediately offload pension liabilities.

Defined-contribution plans

Defined-contribution (DC) plans, such as 401(k) plans in the private sector, are savings plans set up and administered by employers but with individual accounts managed by participants, who choose from a number of investment options. Employers are not required to contribute to these accounts, though a common arrangement is an employer match on the voluntary employee contribution up to a specified level (for example, a 50 percent match up to 6 percent of pay). Instead of

monthly pension checks, participants in DC plans usually receive lump sums when they retire, the size of which depends on how much they set aside, their investment return, and whether they borrowed or cashed out any of the money in their accounts.

Relative to the private-sector 401(k) plans, public-sector DC plans (usually known as 403(b) or 457(b) plans) may offer more protections to workers, such as the option of purchasing a life annuity. However, as in the private sector, employees bear all the investment risk. Currently, only three states, Alaska, Michigan, and Oklahoma, have mandatory DC plans as the primary retirement plan for some or all state employees.

Two-tier DB-DC plans

Some state and local governments combine a smaller DB pension with a DC plan, a hybrid arrangement viewed as a way to combine the advantages of both types of plans (Munnell et al. 2011). Nine states—California, Georgia, Indiana, Michigan, Oregon, Rhode Island, Tennessee, Utah, and Virginia—currently have two-tier plans.⁶

It is difficult to generalize across these plans, which vary in terms of employer contributions and the adequacy of the minimum (or maximum employer-subsidized) benefit. Utah, for example, has an employer-funded DB component that rivals some stand-alone DB plans, with a benefit multiplier of 1.5 percent. Utah’s DC plan is almost an afterthought, with the employer contributing only to the extent that the normal cost of the DB plan falls below 10 percent of pay. Perhaps more typical is Virginia’s plan, which combines a DB benefit with a 1 percent multiplier and a DC plan with a minimum 1 percent employee and 1 percent employer contribution. This is not enough to ensure an adequate retirement for career employees unless they make additional voluntary contributions, which are eligible for a 50 percent employer match up to 5 percent of pay.

Cash balance plans

Cash balance plans are another type of hybrid plan with features common to both DB and DC plans. Like DB pensions, they are employer-provided plans with automatic participation and pooled and collectively managed funds. Benefits, however, are communicated to employees as account balances that appear similar to DC accounts, though they are only “notional” or hypothetical accounts.

Annual benefit accruals are calculated as a fixed share of salary (the “pay credit”) eligible to earn a specified “interest credit” that may be fixed or variable—for example, tied to Treasury bond rates or pension fund returns. The interest credit cannot be less than 0 percent, which means employers incur at least some long-term liabilities and explains why even cash balance plans with variable interest credits are legally considered “defined-benefit” plans. As will be discussed later, plan sponsors offering fixed interest credits or variable credits with rate-of-return guarantees above 0 percent can incur investment risks comparable to the risks incurred by sponsors of traditional DB pensions.

Unlike DC plans, cash balance plans are required to offer life annuities as the default payout option, though benefits are more commonly taken in lump sums. A few public cash balance plans, such as those in the Texas Municipal Retirement System, require that at least some account balances be annuitized at retirement (TMRS 2013). Despite the availability of life annuities, participants in cash balance plans—like those with DC plans—may find it difficult to anticipate how their account balances will translate into retirement income, especially if the interest credit or annuity conversion rate is variable. Even if these rates are fixed, however, participants need to factor salary growth and other assumptions into retirement calculations, and experience has shown that workers with account-type plans tend to greatly underestimate the savings needed for retirement.

In public-sector cash balance plans, the pay credit is typically split between employers and employees, and the employee contribution is deducted from employees' salaries. The employer is also responsible for making up any difference between the interest credit and investment returns—or conversely, reaps any excess returns. However, the employer does not actually contribute its portion of the pay credit toward the notional accounts. Rather, as with traditional DB plans, required employer contributions are calculated as the normal cost minus the employee contribution plus any amortization payment. The normal cost is calculated as a share of total payroll and based on actuarial projections that typically involve many of the same assumptions used to estimate the normal cost of traditional DB pensions.

Generally, employers contribute significantly less than their share of the pay credit plus interest credit each year, so costs may or may not be more predictable (and underfunding may or may not be less likely) than under traditional DB plans. On one hand, cost estimates of cash balance plans may be somewhat less sensitive to salary growth and other assumptions than cost estimates for traditional DB pensions. On the other hand, there is less experience on which to base assumptions, especially on turnover and cash-outs (which are likely to increase with cash balance plans). The cost of complex variable interest credits designed to share risk between employers and employees is also hard to predict.

Though a hot topic in public pension debates, cash balance plans remain relatively rare. Some state and local government employees in California, Nebraska, and Texas have cash balance plans as their primary retirement benefit. Other state and local governments offer cash balance plans as an option. Two other states (Kansas and Kentucky) will require future employees to participate in cash balance plans. Legislation creating a cash balance plan was passed in Louisiana but overturned in court.

For further reading, see *A Review of Defined-benefit, Defined-contribution, and Alternative Retirement Plans* published by the Texas Pension Review Board (2012).

Cost-effectiveness of traditional pensions

Switching public-sector workers to account-type plans is often assumed to save employers, and by extension taxpayers, money. But as will be explained below, DB plans tend to be more efficient than DC plans and two-tier DB-DC plans, meaning benefits will be higher for any given level of costs and costs lower for any given level of benefits due to economies of scale and professional investment management. Traditional DB pensions also provide more risk pooling and intergenerational risk smoothing than most other plan types, including cash balance plans with variable interest credits. Finally, switching plan types introduces transition costs.

The popular misconception that individual-account plans are cheaper stems from their widespread adoption in the private sector, where employers replaced DB pensions with less generous DC plans. The rise of 401(k) plans in the 1980s and 1990s coincided with a long bull market that gave false confidence to many individual investors. As a result, private-sector employers may have been able to shift some of the cost and all the risk of retirement onto employees without fully offsetting this with higher pay. But 401(k) plans became less popular after asset bubbles burst in 2000 and 2007. Public-sector workers accept lower salaries than similarly skilled private-sector workers but are compensated for this (at least in part) with more generous and secure benefits (see, for example, Allegretto, Corcoran, and Mishel 2004, 2008, 2011; Bender and Heywood 2010; Keefe 2010; Munnell et al. 2011; Schmitt 2010). Moreover, public-sector workers already contribute toward their own retirements, so there is no a priori reason to expect cost savings from a switch to DC plans in the public sector rather than the reverse.

Since there is no cost advantage to DC and hybrid plans, advocates instead point to what they see as a better distribution of benefits. For example, Josh McGee of the Arnold Foundation concedes that taxpayers will not benefit from changing plan type, but views final-average-salary DB pensions as unfair to mobile workers because benefits are more valuable to workers who stay with the same employer until retirement (McGee and Winters 2015). As will be discussed later in this report, a worker who works for two or more employers providing similar final-average-salary DB pensions will not receive as large a benefit as a worker who spends his or her career with either employer, since these plans are designed in part to encourage retention.

Other advocates of account-type plans point to supposed advantages that may provide indirect cost savings. For example, some critics of traditional DB plans claim that younger workers or skilled workers prefer account-type plans (see, for example, Chingos and West 2013). If true, offering account-type plans could make it easier to recruit and retain these workers, though there is little evidence to support this assertion. Other public pension fund critics inflate the cost of traditional pensions using a lower rate to discount future DB benefits in order to account for the investment risk borne by taxpayers (see, for example, Biggs 2012). Since the other side of the coin is that for any given cost, the future value to workers of DC or variable-rate cash balance benefits is lower than that of traditional DB benefits due to the investment risk borne by *workers*, this is not a point in favor of DC or hybrid plans.⁷

New account-type plans are often introduced alongside cuts to earned benefits and other changes that obscure the cost, which is often equal or greater than the cost of the traditional DB pension the new plan replaces. In Rhode Island, for example, a switch to a two-tier DB-DC plan was promoted as necessary for budgetary reasons even though actuarial reports showed the switch would increase costs (Hiltonsmith 2013; Morrissey 2013).

Rhode Island Governor Gina Raimondo, who as state treasurer supported the plan, was able to obscure the higher cost of the new plan by extending the amortization period for paying down legacy costs and making cuts to earned pension benefits that are now being challenged in court (Comtois 2014; Hiltonsmith 2013; Morrissey 2013). This is not unusual, even in a climate of budget austerity, because proponents are eager to show that the new plan provides adequate benefits—but the new system introduces transition costs and is less efficient overall.

Pooled funds are more efficient

Participants in DC plans earn lower investment returns and pay higher fees than DB pension funds and other large institutional investors, reducing net returns by a percentage point or more (Boivie and Weller 2012; Forna and Rhee 2014; Munnell et al. 2011). This has a significant effect on outcomes since most retirement wealth derives from investment earnings. The difference between a 6 percent and a 7 percent return, for example, amounts to a 17 percent higher benefit for the latter after 30 years assuming 4 percent annual growth in wages and contributions (the difference is greater if you assume lower investment returns, slower wage growth, or a longer investment horizon).

Cash balance plans, like traditional DB plans, have pooled and professionally managed investments. However, for reasons that will be explained below, switching to a cash balance plan is likely to increase employee turnover and cash-outs, reducing the fund's investment horizon and possibly its rate of return. Evidence on this point is limited, however, since few public-sector cash balance plans have been in operation a significant length of time. Advocates of cash balance plans dispute the claim that rates of return will drop if final-average-salary DB plans are converted to cash balance plans (Pew and Arnold 2014). This may be true in the case of plans with fixed interest credits such as two of the longest-running cash balance systems in the country—the Texas Munic-

ipal Retirement System (TMRS) and the Texas County and District Retirement System (TCDRS). TMRS and TCDRS assume rates of return approaching or equal to those assumed by final-average-salary DB plans (7 percent and 8 percent respectively) (TMRS 2014a and TCDRS 2014). However, in cash balance plans with variable interest credits, fund managers may be more risk averse because employers bear downside investment risk with little or no upside potential.

Traditional pensions are better at risk pooling than most account-type plans

DB pensions also provide risk pooling, reducing the need for precautionary saving. Whereas individual savers in DC and many hybrid plans need to accumulate enough to guard against the possibility of outliving their savings or retiring in a bear market, traditional DB pensions need only accumulate enough for average life spans based on average expected investment returns.

Like traditional DB plans, cash balance plans with fixed interest credits shield participants from investment risk. Cash balance plans also offer life annuities as the default payout, though participants usually have the option of taking a partial or total lump sum, and most do. Since annuitization takes place at retirement, cash balance plans shield participants from individual but not cohort longevity risk (except past retirement).⁸ This makes it more difficult for participants to anticipate their retirement income, but is viewed as a positive form of risk sharing by cash balance advocates. Even advocates, however, acknowledge potential problems with annuity rates that are not known in advance and not transparent (Pew and Arnold 2014).

When annuities are optional and many participants take lump sums, this may introduce what is known as an adverse selection problem, since participants who opt for annuities are likely to have longer-than-average life expectancies. This has not been well researched in the context of public-sector cash balance plans. However,

adverse selection is likely to drive up costs for plan sponsors, reduce benefits to participants who annuitize, or both, relative to traditional DB pensions whose participants usually receive lifetime payments rather than lump sums.

Switching plan types introduces transition costs

Switching plan types usually increases administrative costs, since the existing pension must be maintained for current workers and retirees even if future benefits accrue under a different system. Two-tier DB-DC plans are inherently more expensive for similar reasons. However, cash balance plans that operate as a separate tier of an existing DB plan may not significantly increase administrative costs.

Switching plans may also lower investment returns. A key advantage of traditional pensions is that they have long investment horizons because benefit payments are usually a small fraction of plan assets. Closing a plan to new employees in order to switch to a DC or hybrid plan will increase benefit outlays as a share of plan assets. The need to pursue an increasingly conservative investment strategy will reduce investment returns and increase costs in the DB plan's waning years (CalPERS 2011).

Switching to an account-type plan may also accelerate payments to amortize unfunded liabilities. The Government Accounting Standards Board (GASB) has advised employers to amortize unfunded liabilities as a fixed percentage of payroll (which normally increases with inflation and economic growth) or as a level cost, whichever is greater. When pension plans are closed to new workers, covered payroll shrinks, and employers switch to level (as opposed to increasing) amortization payments. In this case, switching to DC and hybrid plans increases short-term outlays, making it difficult to justify the switch as a solution to budget problems. Supporters of cash balance plans counter that GASB standards have changed, and that plans operating as a new "tier" of an existing

pension would not lead to higher amortization payments (Costrell 2012; Biggs, McGee, and Podgursky 2014). However, Keith Brainard of the National Association of State Retirement Administrators points out that legal provisions in many states require policymakers to continue to adhere to these commonsense practices (Brainard 2012).

A closer look at cash balance plan costs and benefits

How cash balance plans compare with traditional DB pensions depends on their design, in particular whether they have fixed or variable interest credits. In general, cash balance plans with fixed interest credits are more like traditional DB pensions in that they provide participants with relatively secure benefits but expose employers to investment risk. Cash balance plans with variable interest credits tied to pension fund returns resemble DC plans to the extent that they shift much of the investment risk onto participants, though they must at a minimum offer a 0 percent floor on investment returns. As will be discussed in a later section, cash balance plans may also have more complex variable interest credits with minimum rate-of-return guarantees above zero.

Cash balance plans with fixed interest credits offer a more secure retirement benefit than those with variable interest credits, but tend to have higher costs or offer fewer protections than traditional DB pensions. In theory, the best cash balance plans can provide career workers with retirement benefits that approach those of traditional DB pensions while increasing the retirement benefits earned by some shorter-term workers. However, the cost will be higher, important disability and other benefits will be lost, or both.

Traditional DB pensions tend to provide better protections for disabled workers and survivors and are more likely to shield retirees from inflation through cost-of-living adjustments. In addition to lacking these protections, many cash balance plans provide meager retire-

ment benefits, though the examples in this report focus on “full-featured” cash balance plans in the interest of making apples-to-apples comparisons. However, the fact that many cash balance plans provide inadequate benefits is probably not coincidental, since it is harder for workers to gauge the generosity of these plans.

The apparent simplicity of cash balance plan benefit formulas is misleading

The costs and risks of cash balance plans are often misunderstood because they are naively associated with the pay credit and interest credit. A cash balance plan with a relatively large pay credit and a relatively low interest credit is not necessarily more generous or less risky to the employer than one with a low pay credit and high interest credit.

This is perhaps best explained with an example. In the most generous TMRS plans, such as the one in Plano, workers contribute 7 percent of pay, with employers responsible for an additional 14 percent pay credit and a fixed 5 percent interest credit and annuity conversion rate (Lowman 2013; TMRS 2014c).⁹ For career employees, retirement benefits approach those of a typical final-average-salary DB pension. For example, a TMRS participant in Plano retiring at age 62 with 30 years of service would receive an annuity replacing approximately 48 percent of his or her final average salary with a 2 percent cost-of-living adjustment (COLA) (author’s estimates based on salary growth and life expectancy assumptions in TMRS 2014b; TMRS 2014d).¹⁰ For a career worker, this is roughly equivalent to a final-average-salary DB plan with a 1.6 percent multiplier and 2 percent COLA, though without disability insurance and other protections usually provided by traditional DB pensions.¹¹

The combined employer and employee pay credit of 21 percent appears high compared with the normal cost of most traditional DB pensions. For example, the normal cost of the Hawaii Employee Retirement System—a

middle-of-the-road traditional DB plan with a 2 percent multiplier and 2.5 percent COLA—is less than 13 percent of pay (CSLGE and CRR’s Public Plans Database 2010). However, pay credits are not actual contributions. The normal cost of cash balance plan benefits is actuarially determined, just as it is in a traditional DB pension. The normal cost of the Plano plan, for example, is 11 percent of pay, much less than the combined employer and employee pay credit of 21 percent (TMRS 2014a).

One reason the normal cost differs from the pay credit is that TMRS actuaries assume a rate of return on plan assets (7 percent) that is higher than the interest credit (5 percent), though the reverse is also possible (TMRS 2014a). A 7 percent rate-of-return assumption is on the conservative side for DB plans, but there is nothing to prevent any DB plan from investing more conservatively and lowering the assumed rate of return. Conversely, cash balance plans can have relatively high rate-of-return assumptions. For example, the Texas County and District Retirement System (TCDRS) assumes an 8 percent rate of return (TCDRS 2014). (TCDRS, founded 20 years after TMRS, mostly covers county rather than city employees.) With respect to investment risk, the only difference between a cash balance plan with a fixed interest credit and a final-average-salary DB plan is that cash balance plans may be required to hold more liquid investments due to employee turnover and cash-outs. This is a potential disadvantage, not advantage, of these types of plans.

Just as the pay credit is not a good measure of the cost of a cash balance plan, the interest credit is not a good measure of the investment risk borne by employers and taxpayers. As with traditional DB pensions, it is the assumed rate of return and the riskiness of plan assets that matter. A relatively high pay credit can offset a relatively low interest credit, and a relatively low pay credit can offset a relatively high interest credit, so over any given time period the same outcome can be achieved with different combinations of the two variables. Nevertheless, the size

of the pay credit versus the interest credit is important because this determines the distribution of retirement benefits between younger and older workers and between workers with relatively high wage growth and relatively low wage growth. All else equal, younger workers will fare better with a low pay credit and high interest credit, as will workers with relatively flat age-earnings profiles.

Another reason the TMRS plan’s normal cost is less than the pay credit is the plan’s 5-year vesting period, as well as the assumption, based on experience, that a significant number of job leavers will cash out their benefits before retirement, forgoing the employer match. Though job leavers who cash out their balances lose one-half to two-thirds of the value of the accrued benefit as well as guaranteed interest credits going forward, the forfeiture rate ranges from 27 percent (for 55-year-old workers in a plan with a 2-to-1 employer match) to 56 percent (for 25-year-olds in a plan with a 1-to-1 match) (TMRS 2014a). Since a major criticism of final-average-salary DB plans is that they do not provide much retirement security for younger and more mobile workers, it is important to keep in mind that account-type plans may fail in this regard as well. Still, younger job leavers who are vested in a cash balance plan and do not cash out their savings will fare better in a cash balance plan than a traditional pension, as will be discussed later in this report.

Though the size of a fixed interest credit determines the distribution of benefits between younger and older participants in a cash balance plan, not the investment risk borne by employers, it is possible to design a cash balance plan that reduces employer investment risk. But this is done by shifting much of this risk onto participants through a variable interest credit, not by specifying a low interest credit, as will be discussed in the next section. In contrast to plans in the venerable TMRS and TCERS systems, which were established in 1947 and 1967 respectively, cash balance plans introduced in recent years typically shift much of the investment risk onto workers through variable interest credits.

Risk, intergenerational fairness, and transparency

Taxpayers in some states face the prospect of paying down large unfunded liabilities, the result of lawmakers neglecting to make required contributions over many years. The problem in these states has little to do with the pensions themselves—for politicians who wanted to spend more and tax less, pensions were simply the easiest bill to shirk.

Nevertheless, pension underfunding has opened the door to critics who say traditional pensions expose taxpayers to too much risk and encourage cost shifting to future generations. These critics say the solution is account-type plans in which workers bear more of the investment and longevity risks. In addition, some retirement experts favor account-type plans because it may be easier to adjust benefits prospectively in response to changing economic conditions. These experts are concerned that in times of budget austerity, current workers are protected by grandfather clauses while new hires bear the brunt of benefit cuts.

Another supposed advantage of account-type plans is that costs are more transparent and predictable, which is undoubtedly true of DC plans. However, as with contributions to traditional DB pensions, contributions to cash balance plans are based on actuarial valuations. Though advocates suggest that these valuations require making fewer assumptions or are less sensitive to these assumptions than valuations for final-average-salary DB plans, introducing novel benefit formulas may make costs more, not less, predictable. In particular, complex variable interest credits designed to share investment risks between employers and workers are poorly understood and may not even reduce taxpayer risk.

Whether these plans actually reduce taxpayer risk, attempts to shift risk from employers to workers tend to be inefficient because workers are less able to gauge the value of the benefit and are rationally more risk averse.

Individual workers with target retirement dates need to save more than pension funds that pool the savings of overlapping generations of workers because such pooling allows the funds to smooth the retirement outcomes of workers who retire during bull and bear markets. Moreover, it is difficult to use retirement benefits as a recruitment tool if it is difficult for workers to anticipate their benefits. In any case, there are ways to address taxpayer risk and pension underfunding that do not exacerbate retirement insecurity, notably through variable employee contributions.

Cash balance plans reduce risks to employers by shifting them to workers

Cash balance plans can enable risk sharing between employers and workers through variable annuity conversion rates and interest credits. When annuity conversion rates are tied to cohort life expectancy at retirement, the cost of unforeseen increases in life expectancy during participants' working years is passed on to participants in the form of lower monthly benefits. Though variable annuity conversion rates reduce longevity risks for employers, they increase longevity risks for workers, who may place a much lower value on uncertain benefits.

Similarly, cash balance plans with variable interest credits are designed to shift investment risk onto participants. Most workers are risk averse, so the fact that those who retire in bull markets will fare better does not make up for the fact that those who retire in bear markets will fare worse, even if, on average, participants come out even or a bit ahead.

In Louisiana, the interest credit in a cash balance plan enacted in 2012 but later struck down as unconstitutional would have ranged from 0 percent to 10 percent depending on the pension fund's investment return. As a result, individual participants would have seen widely varying outcomes depending on the timing of their retirement and investment returns. Approximately one in four participants would have replaced less than half

of his or her preretirement income after 30 years, compared with a predetermined replacement rate of 75 percent under the existing plan (Morrissey 2012).¹² The loss of secure benefits was a particular concern in Louisiana because most public-sector workers there are not covered by Social Security.

Account-type plans may or may not have more transparent and predictable costs

Advocates sometimes suggest that account-type plans can reduce funding risk, making it harder for elected officials to neglect pension contributions and pass these costs on to future generations. For example, Pew and Arnold assert that a “key element” of cash balance plans is “fully funded retirement benefits” (Pew and Arnold 2014). However, without effective legal protections, elected officials may shortchange contributions to cash balance plans as they have shortchanged traditional pensions. In the past, participants were often assured that pension benefits were guaranteed no matter the state of the pension fund. Since courts have recently allowed pension underfunding to be used as a rationale for renegeing on pension obligations, it is unlikely that workers today will be complacent about underfunding in any form.

A frequent criticism of public pensions is that lawmakers can skimp on pension obligations by pressuring plans to use overly optimistic actuarial assumptions. However, there is not much evidence that rosy assumptions were a major factor in most states and cities with large unfunded pension liabilities, since rather than lowballing required contributions, elected officials simply ignored them.¹³

Though contributions to cash balance plans are also based on actuarial valuations, advocates suggest that these require making fewer assumptions than valuations for final-average-salary DB plans. Pew and Arnold cite “reducing the number of assumptions policymakers must make to accurately project costs” as one of the supposed advantages of cash balance plans over traditional pensions. They list “long-term investment returns, salary

increases, employee turnover, and life expectancy” as the assumptions made by DB plan actuaries and suggest that by shortening this list, cash balance plans could make pension funding more predictable (Pew and Arnold 2014). However, cash balance plan actuaries make every single assumption listed above, and many more (see, for example, TMRS 2014a). This is because, as described earlier, employers do not simply contribute their share of the pay credit to the plan and then provide a guaranteed return on that amount plus the employee contribution. Rather, plan actuaries make a number of assumptions to estimate the average normal cost of the plan as a percent of payroll for workers at different stages in their careers and with varying propensities to quit, cash out, retire, and die, among other variables.

Cash balance advocates also claim that actuarial valuations may be less sensitive to certain assumptions, such as salary growth assumptions. However other assumptions will be shakier than those used for traditional DB pensions. In particular, there is less relevant experience on which to base assumptions about employee turnover and cash-outs. In addition, cash balance plans introduced in recent years have variable interest credits whose costs are poorly understood.

Variable interest credits are promoted as a way to share risk without increasing costs, though how this actually plays out can be hard to predict. In the original version of the Louisiana plan, for example, the variable interest credit was not capped. This was changed after the state legislature’s chief actuary found that—contrary to claims by proponents—it would likely increase costs to taxpayers (Richmond 2012; Shuler 2012; Shuler 2013).¹⁴

Similarly a cash balance plan in Kentucky promoted by Pew and Arnold initially provided an interest credit equal to 4 percent plus three quarters of the return above that floor. Pew acknowledged that the switch to a cash balance plan would not save money, but claimed it would provide “a more predictable cost structure” and would be “more flexible if things did not go as expected” (Pew

2013). Pew suggested that the new benefit formula would reduce the risk to taxpayers if investment returns did not match assumptions, as occurred in 2005–2012. However, the new benefit, as initially described, appeared likely to cost more without necessarily reducing the investment risk faced by taxpayers. An outside actuary reviewing the plan for the Kentucky Public Pension Coalition found that the projected cost of the interest credit would be closer to 9 percent than to the 7.37 percent projected by Pew, or than to the Kentucky Retirement System’s assumed rate of return of 7.75 percent (Lowman 2012).

It is counterintuitive that guaranteeing a 4 percent floor on investment returns would be riskier or more expensive than backing a 7.75 percent investment return assumption under the old plan. But under the old plan, taxpayers were only exposed to the risk that investment returns would fail to meet the 7.75 percent assumption over the long run, whereas under the new plan, participants are credited with an annual return equal to 4 percent plus three-fourths of the excess return. Short-run rate-of-return guarantees are more expensive than long-run guarantees, and only under the new system do participants benefit from the upside risk. The Kentucky plan was later amended to reduce costs, including specifying that only 5-year average returns above 4 percent would accrue to active participants and reducing the interest credit for non-active members to 4 percent (Kentucky Legislature; Task Force on Kentucky Public Pensions 2012a and 2012b; Lowman 2012, 2015).

Variable contributions promote risk sharing without retirement insecurity

There are ways to reduce taxpayer risk that do not worsen retirement insecurity. Pension funds can always reduce risk by investing more conservatively, though this is costly. Risk sharing happens in practice with changes in employee contributions. In more prosperous times, workers typically were responsible for somewhat less than half the cost of public employee pensions. However, as

many government employers faced the prospect of paying down large unfunded liabilities in the wake of the 2008 downturn, employee contributions climbed (NASRA 2014). According to Center for Retirement Research, state and local government workers are now responsible for half the normal cost of their pensions on average (Munnell, Aubry, and Sanzenbacher 2015). Thus, with such variability to employee contribution rates, employees are already taking on a substantial share of risk in these plans.

Workforce management

Many criticisms of traditional DB plans relate to features designed to achieve workforce management goals such as recruitment, retention, and orderly retirement. To critics, these features are unfair to mobile workers, cause job lock, and encourage workers to retire too soon. However, critics ignore or downplay negative features of account-type plans, which tend to create more workforce management issues than they solve. In particular, plans that shift investment risk to workers are often shown as providing a steady accrual of retirement wealth, even though account balances will fluctuate, creating unpredictable and even perverse retirement incentives. Though cash balance plans with fixed interest credits do not have this effect, they often provide the biggest benefits to job leavers, promoting high turnover.

Traditional DB pensions encourage retention when employees are likely to be most productive

Final-average-salary DB plans are designed to reduce turnover among experienced midcareer workers while encouraging an orderly transition into retirement around a normal retirement age. (Boivie and Weller 2012 provide a useful review of research on recruitment, retention, and other workforce effects of traditional pensions.) Reducing turnover is especially important in the public sector, where jobs in teaching and public safety require considerable on-the-job training and many skills are not

easily transferable. Firefighters, for example, attend state- or department-run academies and participate in apprenticeship programs for up to four years (U.S. BLS 2014). It is critical to fire departments and prospective firefighters that compensation both serves to attract and retain career-minded workers and ensures that these workers will have secure incomes when physically unable to do the job. Moreover, research has found that workers who value pensions also have other attributes desired by public employers (see Boivie and Weller 2012 for an overview).

Final-average-salary DB pensions encourage employee retention by “back-loading” benefits: Since accrued service credits are multiplied by a worker’s final average salary, a salary increase is worth more to a worker with 30 years of service than one with five years of service.¹⁵ The back-loading of benefits does not extend beyond the designated normal retirement age. Though workers who work beyond the normal retirement age continue to accrue service credits and will receive larger annual pension benefits, their lifetime benefits are reduced because they are not compensated for shorter expected retirements. In contrast, workers who retire before the normal retirement age receive reduced benefits to fully or partially offset longer expected retirements. For most workers, this tilts the labor-leisure balance in favor of leisure—retirement—at or before the normal retirement age, promoting an orderly transition to retirement.

Does the back-loading of benefits up to a point serve a purpose? The fact that workers are not compensated for delaying retirement beyond the normal retirement age reflects productivity, which increases with experience and tenure but may gradually level off or even decline due to health limitations or skill obsolescence. This is not to suggest that older workers who remain in the workforce are less productive than younger workers. The opposite may be true if workers in poor health or suffering from burnout are more likely to retire early while those who continue their educations or are promoted retire later.

The point, rather, is that if workers were unable to retire, we would observe average productivity declining in old age. Thus, gently ushering out “superannuated” teachers with old-school teaching methods was a major factor behind the creation of teacher pensions (Graebner 1978). Similarly, early retirement is usually encouraged for public safety personnel with physically demanding and stressful jobs.

Notwithstanding the claims of some pension critics, a normal retirement age serves as a carrot-type nudge, not a mandated shove, toward retirement. Career workers who work past the normal retirement age remain well compensated compared with less experienced workers, and their lifetime incomes will be higher if they keep working. Moreover, employers who want to retain valued employees can offer promotions and other incentives to delay retirement. Conversely, employers have few alternatives outside of the retirement plan if they want to encourage workers to retire, since cutting the pay of older workers would hurt morale and run afoul of age discrimination laws.

Advocates of account-type plans downplay these advantages or ignore them altogether, focusing on how final-average-salary DB plans penalize mobile workers who have little choice in the matter, such as teachers married to military personnel. They cite statistics showing that few workers, including public school teachers, spend their careers with one employer, suggesting that traditional pensions are ill-suited for a modern workforce. They also say these pensions serve to lock in workers who would be happier and more productive if they changed jobs. Finally, they question the wisdom of encouraging workers to retire around a normal retirement age at a time when many Americans are working into their late 60s or longer.

One claim made by critics of public pensions—that most teachers never accumulate significant retirement benefits due to mobility—is based on a misreading of statistics showing that relatively few teachers retire from the school

district in which they began their teaching careers (McGee and Winters 2015). It is possible that most people who ever try teaching, however briefly, do not accrue much in the way of benefits, even if *most teachers teaching today* will do fine, and what matters is the latter. Many young teachers change districts for a better job match, marriage, education, or other reasons. Others take time off to raise children. However, teacher pensions are designed to provide adequate benefits for teachers who start accruing service credits in their 30s or later. More generally, 30-year careers, not 40-year careers, are the standard assumption in public-pension benefit calculations.

Of course, some attrition is of young teachers who decide the job is not right for them, and some of these former teachers will not have good benefits in their new jobs, especially in the private sector. But this is an indictment of our employer-based retirement system writ large, not teacher pensions, since it is unlikely these former teachers would have built up significant savings or benefits in other jobs. According to the Federal Reserve's Survey of Consumer Finances, nearly 40 percent of households headed by someone 35 or younger had nothing saved in retirement accounts in 2013, and even the typical family with savings had only \$12,000 (Federal Reserve Board 2014). The important point is that there is little turnover among midcareer teachers, which is what matters if the concern is teachers laboring for years without accruing significant benefits.¹⁶

The design of a cash balance plan can favor younger workers over older workers or vice versa

Cash balance plans are advanced as a fairer alternative to final-average-salary DB pensions that provide more generous benefits to older career workers than to younger or more mobile workers. However, cash balance accruals are "fair" only if the interest credit is set at a rate that, all else equal, equalizes the value of contributions to older and younger workers.

Another way of saying this is that cash balance plans provide a benefit of equal value to younger and older workers only if the interest credit is one that would make participants indifferent about whether to leave their savings in the plan or invest them elsewhere (or that makes employers and taxpayers indifferent about the same).¹⁷ Since interest credits vary widely, this is unlikely to be true of all cash balance plans, meaning that some favor younger workers and some older workers. The former is a more serious problem because it provides the largest benefits relative to pay to young job leavers—thus rewarding turnover.

What is a fair interest credit (one providing equal benefits to younger and older workers) is subject to debate. However, it will probably lie somewhere between the risk-free rate and the expected return on pension fund assets, both of which are used, in different contexts, to discount future retirement benefits (U.S. GAO 2014). This may be easiest to understand with an example. The Texas County and District Retirement System provides a relatively high (7 percent) interest credit. A hundred dollars credited to the account of a young worker who is 30 years from retirement will be worth \$761 at retirement ($\100×1.07^{30}). The same amount credited to an older worker who is 10 years from retirement will be worth \$197 at retirement ($\100×1.07^{10}). The present value of the younger worker's benefit, discounted using the 3 percent interest rate on Treasury bonds, is \$314 ($\761×1.03^{-30}). Using the same discount rate, the present value of the older worker's benefit is just \$146 ($\197×1.03^{-10}), which is less than half the benefit received by the younger worker. This method measures the cost of funding TCDRS benefits with no risk to taxpayers since Treasury securities are considered very safe investments. By this measure, TCDRS benefits are highly "front-loaded."

This is not a good measure of expected outlays, since TCDRS actuaries expect a much higher 8 percent return on assets. Using an 8 percent discount rate, expected out-

lays will actually be lower for younger workers ($\$761 \times 1.08^{-30} = \76) than older ones ($\$197 \times 1.08^{-10} = \91). This is what TCDRS actuaries think benefits will cost on average, ignoring the fact that employers are taking on investment risk.

A fair interest credit, at least from an employer or taxpayer perspective, will lie somewhere between these two extremes, though exactly where depends on risk aversion and other factors. Almost all investors—as opposed to gamblers—would accept a lower investment return to reduce risk, but few employers or taxpayers would want pension fund managers to invest the fund’s entire portfolio in Treasury bonds on their behalf, doubling or tripling required contributions.

Though setting a fair interest credit may be tricky, there is little doubt that a 7 percent fixed interest credit is too high to equalize benefits between younger and older workers. Only a poorly informed or highly risk-seeking investor would forgo such a good deal to invest elsewhere, though job leavers may cash out for other reasons. This example shows that we should not assume cash balance plans provide an equal benefit to younger and older workers, since, depending on the interest credit, benefits may be back-loaded or, as in this case, front-loaded. This is not just a problem with plans like those in TCDRS that provide high fixed interest credits, but also plans like the one in Kentucky that provide generous variable credits.

Is a picture worth a thousand words? Peaks and valleys in accrual patterns can be misleading

In addition to questioning the back-loading of benefits, critics of traditional DB pensions point to discontinuities in benefit accrual caused by eligibility criteria and benefit formulas such as vesting periods or a normal retirement age.¹⁸ Though such discontinuities are common in employee benefits and social insurance, they can look arbitrary in discussions that ignore the history and ratio-

nale behind eligibility rules and benefit formulas. It is important to note, however, that account-type plans, including cash balance plans, often have vesting periods, so concern for job leavers who do not vest is not a good reason to change the plan type as opposed to simply eliminating or shortening vesting periods.

Kinks in accrual patterns can make sense when employers are trying to balance retirement security with recruitment, retention, and other workforce management goals. Plans with simple rules allow employees and prospective employees to understand and plan around their retirement needs. The cost of administering benefits also needs to be considered, especially for workers who leave long before retirement age. As mentioned, employers seek to avoid costs associated with turnover, including recruitment and on-the-job-training costs, but also want to manage the transition to retirement. While too much turnover is a problem if midcareer employees leave after employers have invested in their training, too little turnover can be a problem if older workers cannot afford to retire. Many public safety jobs are physically demanding or stressful. Employers also need to be able to adjust their workforce to meet changing needs.

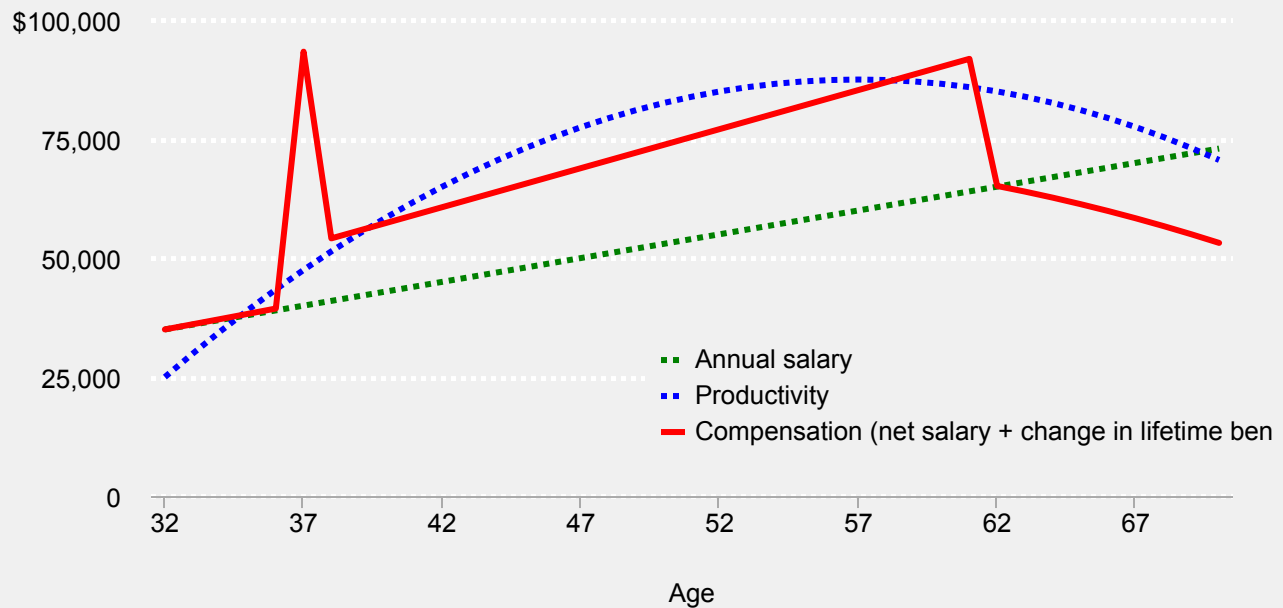
The red line in **Figure A** illustrates discontinuities, or kinks, in benefits under a simple final-average-salary DB plan.¹⁹ In the figure, benefits appear extremely back-loaded and spikes at the end of the vesting period and the normal retirement age seem large and arbitrary. Pension fund critics have described such discontinuities as “peaks and valleys” (Costrell and Podgursky 2008; see also Johnson, Steuerle, and Quakenbush 2012; Morrissey 2009).

Critics of traditional pensions contrast the kinks in final-average-salary DB plans with smooth accruals in idealized account-type plans, as shown in **Figure B**.²⁰ Even ignoring the fact that vesting periods are not limited to traditional pensions, graphical comparisons of traditional final-average-salary DB plans and cash balance plans can give the misleading impression that a smooth line such as that in the graph of a cash balance plan indicates a steady

FIGURE A

Final-average-salary defined-benefit plan

Hypothetical benefits, salary, and productivity over work lifetime



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accrual of benefits—that is, benefits that are a fixed percent of pay for young and old alike. In fact, there is no way to tell at a glance whether this is the case, since even benefits that are a fixed percent of pay are increasing in dollar terms and thus will appear back-loaded (that is, increasing with age rather than causing the compensation line to run parallel to the salary line). Compensation and salary lines that appear roughly parallel, as in Figure B, actually show a front-loaded benefit, since the benefit is much larger relative to salary for younger workers. This is not to deny that final-average-salary DB benefits are back-loaded, but simply to point out that pictures tend to exaggerate this effect while obscuring what is likely to be the opposite effect in cash balance plans.²¹

Similarly, “peaks and valleys” charts can be misleading because they suggest to casual readers that declining compensation under final-average-salary DB plans (the

downward slope of a line on the chart) is inherently problematic even if the level of compensation remains high for older workers. (This is particularly true when pension benefits are shown in isolation, which is not the case in these figures.)

The strange or arbitrary-seeming kink in the DB plan’s compensation curve caused by the vesting period can also be misleading. Even if benefits are not front-loaded, a plan without a vesting period will tend to increase costs associated with turnover if total compensation exceeds productivity for inexperienced workers. In contrast, the kink in the compensation curve caused by the vesting period may better align compensation and productivity. Final-average-salary DB plans help employers recruit career-oriented workers rather than workers who are likely to leave after a few years, saddling employers not only with the cost of recruiting and training replacements

FIGURE B

Cash balance plan with a fixed interest credit

Hypothetical benefits, salary, and productivity over work lifetime



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but also administering benefits and paying interest for job leavers for decades to come.

Though Figure B illustrates an idealized cash balance plan with a fixed interest credit and no vesting period, a smooth line is often used to illustrate benefits under DC and cash balance plans in which participants bear investment risks. This ignores the considerable risks borne by these participants. The red line in **Figure C** shows the effect of investment returns from 1975 to 2013 on a DC plan participant with a portfolio split equally between stocks and bonds.²² The resulting peaks and valleys are much more extreme than those in the final-average-salary DB plan—they are literally “off the chart.” Moreover, their effect on retirement decisions is not just arbitrary, but perverse: Since retirement account savings tend to increase when the economy is strong and contract when the economy is weak, older workers are encouraged to

retire when hiring replacements is difficult and to delay retirement when unemployment is high (Boivie and Weller 2012; Ghilarducci, Saad-Lessler, and Fisher 2011; Weller and Wenger 2008).

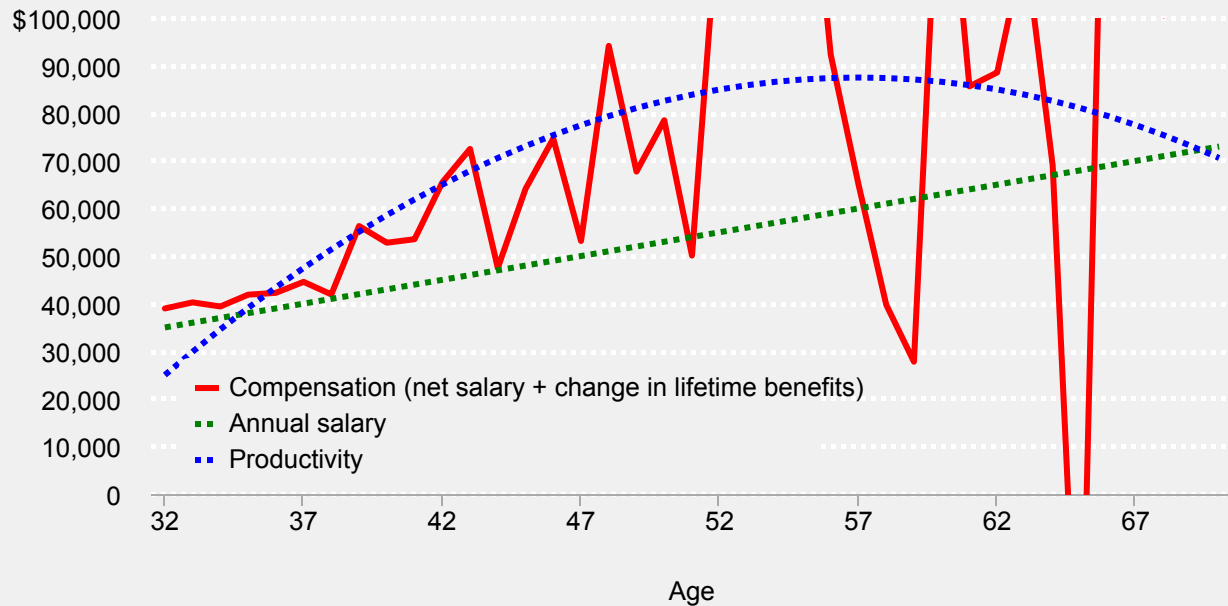
How workers value pensions

The overall cost-effectiveness of pooled pensions over defined-contribution plans and most hybrid plans is not seriously in dispute. But some advocates of account-type plans suggest that they may save employers money by appealing to a modern mobile workforce. In this view, final-average-salary DB pensions give older or long-career workers too many benefits and younger or more mobile workers too few, so redistributing benefits may allow employers to reduce compensation costs with no adverse effect on recruitment or retention.²³

FIGURE C

Defined-contribution plan

Hypothetical benefits, salary, and productivity over work lifetime



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However, there is little evidence that public-sector workers of any age prefer account-type plans. The suggestion that these workers place a low value on traditional DB pensions is belied by the fact that they negotiate higher employee contributions rather than simply cutting benefits in the face of budget cuts. A study by the Center for Retirement Research comparing the experiences of public employers around the country found that pensions serve to retain skilled workers who would command higher salaries in the private sector, and that workers value pension benefits even if they fund the benefits themselves (Munnell, Aubry, and Sanzenbacher 2015). Meanwhile, a study purporting to find evidence that Illinois teachers were not willing to pay much for pension benefits actually showed that the vast majority of teachers who had the chance to purchase additional benefits did so.²⁴

When given a choice, public-sector workers overwhelmingly opt for traditional DB pensions. A study of recent elections by newly hired (therefore typically younger) workers in seven states that offered a choice found that between 75 percent and 95 percent chose the DB plan over a DC or hybrid DB-DC plan (Olleman and Boivie 2011; Oakley and Boivie 2014). Hybrid plan advocates point to the fact that a majority of teachers in Washington state opted into a new DB-DC plan when it was introduced in 1997 (Goldhaber and Grout 2014). However, since then, a majority of new teachers—and indeed a majority of other Washington state workers—have chosen the DB plan even though the DB-DC plan is the default. Oakley and Boivie (2014) note that teachers in 1997 were likely swayed by unusually high stock returns during the dot-com bubble as well as an upfront payment for switching plans that was presented as a “bonus.”

Conclusion

It is often assumed that traditional defined-benefit pensions are expensive and that switching to account-type plans, including cash balance plans, is a way to save state and local governments money. This is not correct. Generally, the only way to save money in the short run is to cut benefits or increase employee contributions. In the long run, benefit cuts are unlikely to save taxpayers money because public-sector workers value these benefits and are paid less than private-sector workers. Instead, cuts will likely lead to offsetting increases in other compensation or impair recruitment and retention, degrading the quality of public services.

Another criticism of traditional DB plans is that they are inflexible and benefit older workers at the expense of younger workers. However, benefit formulas and eligibility rules can be adjusted to change the timing and distribution of benefits. For example, increasing the salary averaging period will tend to reduce the back-loading of benefits, though it will also reduce benefits overall unless offset by other changes, such as an increase in the benefit multiplier. The value of benefits earned by younger and more mobile workers can be increased a number of ways, such as indexing them to inflation and shortening vesting. However, these changes will cost money at a time when most pension funds remain underfunded due to the lingering effects of the 2008 downturn. They will also increase turnover.

Plans that shift investment risk to workers are often shown as providing a steady accrual of retirement wealth, even though account balances will fluctuate, creating unpredictable and even perverse retirement incentives. Though cash balance plans with fixed interest credits do not have this effect, they often provide the biggest benefits to job leavers, promoting high turnover.

Even a cash balance plan with a fixed interest credit that equalizes the present value of benefits of younger and older workers will nevertheless result in greater retire-

ment wealth for workers who participate when they are young, since contributions to their accounts have longer to accrue interest. In contrast, Social Security, a pay-as-you-go system tying benefits to wage-indexed lifetime earnings, provides similar retirement benefits to workers regardless of age. That younger workers have better outcomes even under such “fair” cash balance plans would not matter much if participation were universal, as in the Economic Policy Institute’s Guaranteed Retirement Account plan, because most workers would accrue benefits at different life stages (Ghilarducci 2007). But it is important to keep in mind that even a fair cash balance plan does not result in equal retirement outcomes for younger and older participants.

Employers, and by extension taxpayers, care more about minimizing compensation costs relative to productivity than whether the present value of retirement benefits is a fixed percent of pay. This includes taking into account how workers value different types of benefits and how this affects recruitment and retention.

State and local governments have a duty to consider the retirement security of all workers, not only career employees. But before benefits are redistributed from older and career workers to younger and short-term workers through cash balance plans, it should be shown that career workers can still accrue benefits that enable them to retire from a life in public service without seeing a sharp drop in their standard of living.

The most generous and secure cash balance plans may be a good compromise in some circumstances, but the advantages of these and other account-type plans should not be oversold, nor should the disadvantages of traditional pensions be exaggerated. Traditional DB pensions help public employers recruit career-minded workers and facilitate orderly retirement. Advocates of DC and hybrid plans do not explain why they are more concerned about job lock among midcareer workers than the problem of older workers with inadequate or insecure retirement benefits hanging on to jobs for dear life. Rather than

attacking the pension benefits of career employees, those concerned with the retirement security of mobile workers should focus on expanding Social Security, the most portable and secure retirement benefit of all.

DC plans have been a disaster in the private and public sector. In West Virginia, Michigan, and Alaska, high costs and low account balances prompted these states to abandon DC plans in favor of a traditional DB plan, a two-tier DB-DC plan, and a cash balance plan, respectively (Pension Review Board 2012). Because problems with DC plans are so apparent, advocates of account-type plans are promoting hybrid plans instead. Though these are better than stand-alone DC plans, it is too soon to tell how these plans will work. Advocates of account-type plans ignore or downplay evidence that these plans cost more, exacerbate retirement insecurity, or both. Rather than a more equitable and efficient system, some account-type plans turn retirement into a gamble while others provide the biggest benefits to job leavers, promoting high turnover. These plans, at least in their current incarnation, are oversold and poorly understood, and we risk embarking on another failed experiment.

—*The author would like to thank Tanyell Cooke for providing research assistance on the report.*

Endnotes

1. For more on cuts and plan funding, see CSLGE and NASRA 2014, Morrissey 2014, Munnell et al. 2013, NASRA n.d., NASRA 2015.
2. The Laura and John Arnold Foundation (the Arnold Foundation) refers to Pew Charitable Trusts as its “partner” in public pension initiatives. While the Arnold Foundation openly favors account-type retirement plans, Pew says it does not support a one-size-fits-all retirement solution (McGee 2011; Pew 2013). However, Pew has never shown evidence of substantive disagreement with Arnold when it comes to promoting cash balance plans around the country.

3. Munnell et al. (2011 and 2014) and NASRA (2013) provide useful overviews of DC and hybrid plans in the public sector.
4. The normal cost of a pension is the estimated cost of pension benefits accrued by workers in a year, often expressed as a percent of pay. It takes into account salary projections—how much workers’ service credits will be worth at retirement when multiplied by final average salaries—but not costs associated with past service liabilities. (NEA 2010 and NEA 2015 provide a useful glossary and overview of typical plan features.) The Public Funds Survey puts the workers’ share of the actuarially required contribution (ARC) at slightly over a third (NASRA 2013). The ARC includes the normal cost plus any amount necessary to gradually amortize a surplus or unfunded liabilities over a number of years (often 30). These liabilities are the responsibility of the employer and may be due to a past failure by employers to contribute the required amounts, unmet investment or other assumptions, or some combination of the two.
5. A discount rate is used to translate future cash flows to present values, since most people prefer a dollar today to a dollar tomorrow. This is straightforward if the money is invested in highly tradable and “risk-free” assets such as U.S. Treasury securities, where “risk-free” is a reference to the extremely low risk of default (like all bonds, Treasuries still fluctuate in value in response to changes in interest rates). In this case, the discount rate is the same as the current yield on risk-free assets of the same maturity. This is also the discount rate that returns the cash value of the security if it were sold today (a risk-free asset worth \$103 dollars next year can be sold for \$100 today if the risk-free interest rate is 3 percent).

The story is more complicated when investment returns are uncertain but expected to be higher than the risk-free rate, as is the case with public pension fund assets. In this case, the expected return on fund investments is the rate used to estimate the amount that, contributed today, would most likely pay for future pension obligations, though plan sponsors may end up contributing more or less depending on actual returns. The expected return used in these calculations takes into account historical returns as well as other factors; for example, expected returns on stocks

should generally be lower than historical returns if price-earnings ratios are high by historical standards (Baker, DeLong, and Krugman 2005). This measure does not take into account plan sponsors' risk aversion—how much more they might be willing to pay to eliminate investment risk. Pension obligations discounted using the risk-free rate provide an upper-bound measure of this hypothetical value: Since pension funds are invested in portfolios that include stocks and other risky assets, we can assume that plan sponsors would not be willing to invest entirely in low-yield Treasuries to eliminate investment risk.

6. This does not include states that offer voluntary employee-funded DC plans on top of full DB pensions. These supplemental savings plans are available to workers in most states.
7. The argument for using the risk-free rate is that it accounts for the investment risk borne by employers by measuring the cost of eliminating this risk. As explained in an earlier endnote, discounting pension obligations with the risk-free rate provides an upper-bound estimate of plan sponsors' risk aversion.
8. Both cash balance plans and traditional DB pensions use risk pooling to insure individuals against the risk of living longer than average and thereby outliving their savings by providing retirement benefits in the form of an income stream. However, because traditional pensions provide benefits tied to final average salary for the life of the retiree, the normal cost of the plan requires projecting salary growth and life expectancy in retirement decades in advance. Because cash balance plans annuitize at retirement, they only need to project life expectancy over the retirement period.
9. Many TMRS plans are much less generous. The plan for the San Antonio Water System, for example, has a 3 percent employer contribution, a 3 percent employee contribution, and a normal cost of just 2 percent of pay (TMRS 2014; TMRS 2014b).
10. The maximum COLA available to TMRS plans is 70 percent of consumer price index (CPI) inflation and TMRS actuaries assume CPI inflation will average 3 percent annually.

11. TMRS plans, like most cash balance plans, allow disabled workers to access accumulated savings as opposed to providing supplemental insurance like most FAS DB pensions.
12. This estimate is based on the author's analysis of an earlier version of the plan. Replacement rates would be slightly lower under the revised plan, which capped the interest credit at 10 percent.
13. Detroit is an exception to that rule, but even here other factors played a bigger role.
14. The interest credit was equal to the portfolio return minus 1 percent, which was supposed to serve as a buffer against market losses.
15. Using our earlier example and assuming an additional year of work increases a worker's average salary over the past five years from \$50,000 to \$52,000 (a 4 percent increase), a worker with five years' tenure will increase her future pension by \$930 per year if she works an additional year $((1.5 \text{ percent} \times 6 \text{ years} \times \$52,000) - (1.5 \text{ percent} \times 5 \text{ years} \times \$50,000))$, whereas one with 30 years' tenure will increase her future pension by \$1,680 per year for an additional year worked $((1.5 \text{ percent} \times 31 \text{ years} \times \$52,000) - (1.5 \text{ percent} \times 30 \text{ years} \times \$50,000))$.
16. Even teachers who leave mid-career may be headed for greener pastures in other school districts. Though past service credits will no longer be affected by salary increases, a promotion boosts the value of any future service credits, and the latter effect can more than offset the former.
17. An interest credit that equalizes the value of benefits from a worker's perspective is not necessarily the same as one that equalizes the cost of benefits from an employer or taxpayer perspective. Furthermore, even one that equalizes the present value of benefits to workers at different stages in their careers will not result in equal retirement outcomes, since younger workers will have longer to accrue interest.

More so than cash balance plans, intergenerationally fair and portable benefits are provided by multiemployer pensions. These plans, which are common in industries such as construction where mobility is often inevitable, typically provide benefits based on a fixed dollar amount multiplied by years of service (Weinstein and Wiatrowski 1999;

Topoleski 2014; Munnell and Aubry 2014). Since employer contributions to these plans are usually a fixed dollar amount per hour rather than an amount that increases with age, there is redistribution from younger to older workers in terms of the cost of advance-funding these benefits, but outcomes are more equal.

18. In a final-average-salary DB pension, benefit formulas are based on a “normal retirement age” that is not the earliest eligibility age, usually referred to as the “early retirement age.” Thus, in our earlier example, benefits are equal to 1.5 percent multiplied by years of service multiplied by final average salary at the normal retirement age of 62, even if workers are first eligible to collect retirement benefits at, say, 55. Workers who work beyond the normal retirement age receive larger pensions due to additional years of service and presumably higher final average salaries. However, the lifetime value of their pension is reduced because they receive the pension over fewer years. Workers who retire before the normal retirement age receive smaller pensions to partly or fully offset the cost of their longer expected retirement. Whether or not workers who retire early receive greater lifetime benefits depends on whether the employer wants to encourage early retirement. Social Security beneficiaries who retire at 62, for example, receive monthly benefits that are 20 percent lower than those who retire at 65, an adjustment intended to be actuarially fair (Munnell and Sass 2012). Pension plans may use a lower actuarial reduction than Social Security to encourage turnover among older workers, which can result in two noticeable “kinks” or discontinuities in a graphical representation of the pension benefit rather than one. For simplicity, this report will focus on the general question of whether discontinuities in benefits at designated ages can make sense in a real-world context.

19. Assumptions are as follows, adjusted for 2 percent inflation: Starting salary is \$35,000 and grows by \$1,000 per year. Starting productivity is \$25,000 and grows by a declining amount equal to \$5,000 per year minus \$100 times years of service squared. The discount rate is 1 percent. The employee contribution rate is 5 percent. The benefit at the normal retirement age of 62 is equal to 1.5 percent multiplied by years of service and 3-year final average salary. The vesting period is 5 years. The early

retirement age is 55, with lifetime benefits adjusted to equal lifetime benefits at the normal retirement age.

20. Cash balance plan salary, productivity, discount rate, and employee contribution assumptions are the same as for the final-average-salary DB plan. The employer is responsible for funding a 10 percent pay credit, which, along with the 5 percent employee contributions, is eligible for an employer-provided 5 percent interest credit. The benefit is withdrawn as a lump sum at age 70. The normal cost of the cash balance plan may be higher or lower than the normal cost of the final-average-salary DB plan depending on rate of return, tenure, cash-out, retirement age and life expectancy assumptions. Career workers will tend to do better under the final-average-salary plan and mobile workers will tend to do better under the cash balance plan if they do not cash out.

21. This assumes the analysis takes into account the present value of future interest credits, which can be the bulk of the benefit for younger workers. The present value of the benefit is sometimes assumed to equal the pay credit, which is true only if the discount rate equals the interest credit.

22. The DC plan employer contribution is 10 percent and the DC employee contribution is 5 percent. Investments are divided equally between stocks and bonds and accrue returns equal to those on the S&P 500 index and the Barclay’s US Aggregate Bond Index from 1975–2013.

23. The distribution of benefits between mobile and career employees is sometimes discussed as a “portability” issue. The ability of job leavers in many account-type plans to cash out their savings is not an advantage from a retirement security point of view, though the ability to roll savings over to another plan is. Describing account-type plans as more “portable” can give the misleading impression that mobile workers in DB plans lose their benefits, which is only true of employer-funded benefits for workers not yet vested in the plan. Since DC and hybrid plans can have vesting requirements, this is not an inherent advantage of account-type plans.

24. Of roughly 20,000 Illinois teachers offered the chance to purchase a pension upgrade in 1998, three-fourths had done so 10 years later, and more may have done so before retirement (Fitzpatrick 2014).

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