Modernizing Teacher Retirement Benefit Systems

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Retirement benefits have long been an important part of teacher pay. Traditionally, current compensation, received primarily as salaries, has been considered relatively low for teachers, but pension benefits have been relatively high. Almost every state in the nation offers its public school teachers traditional defined-benefit (DB) pension plans that provide lifetime payments beginning at retirement. Benefits increase with years of service and, in some states, long-tenured teachers can receive annual retirement payments that approach the salaries they earned while they were teaching. Because many states allow teachers to retire as early as age 55, some retirees collect benefits for more than 30 years, sometimes longer than their careers. Additionally, many states and districts offer teachers retiree health benefits, providing stand-alone health insurance until retirees qualify for Medicare at age 65 and then supplementing Medicare benefits.

The structure of retirement systems in K–12 public schools may not serve all teachers, school districts, or taxpayers well. For young teachers, these pension systems can impose sharp penalties for mobility, because the benefits in teacher pension systems are heavily back-loaded (i.e., they accrue to teachers disproportionately in the last years of teaching). They also severely penalize teachers who remain in the profession for a full career but who change pension systems. A 55-year-old educator who taught for 30 years in Missouri, for example, would have at least twice
the pension wealth of an otherwise identical educator who split her career equally between Missouri and another state. As workers change jobs more frequently, retirement plans that reward long tenures and punish mobility are becoming less attractive to mobile young professionals. In this respect, the retirement systems in education place the teacher labor market at a relative disadvantage when it comes to attracting new, but mobile, talent into the teaching profession.

In addition, many teacher pension plans create strong financial incentives for teachers to retire as soon as they qualify for benefits, often at relatively young ages (Costrell and Podgursky 2009b). The incentives pull teachers to certain retirement ages and push them out past those ages. However, in today’s workforce, many professionals prefer to delay retirement as the average lifespan lengthens. In fact, many schools prefer to retain their most experienced teachers, especially as the supply of younger teachers shrinks. Thus, some districts hire back retired teachers, effectively paying some teachers salaries and pensions simultaneously (this is often referred to as “double dipping”).

The private sector has largely abandoned the types of retirement benefits that public school teachers receive. Whereas nearly all public school districts participate in traditional DB pension plans, most private-sector employers have switched to defined-contribution (DC) retirement plans that function essentially as tax-advantaged retirement savings accounts and do not introduce strong incentives to retire at any particular age. Between 1980 and 2007, the share of private-sector workers participating in DB plans fell from 39 to 20 percent, while the share that participated in DC plans but not DB plans increased from 8 to 31 percent (Bureau of Labor Statistics 2007b; Pension and Welfare Benefits Administration 2001–2002). Many private-sector employers that maintain DB plans have converted to “cash balance” pension plans. These plans permit pension wealth to grow more smoothly over a worker’s career and thus do not impose such strong penalties on worker mobility (Johnson and Uccello 2004). Additionally, most private-sector employers have stopped providing retiree health insurance (Johnson 2007).

This chapter examines teacher retirement systems. It describes how teacher pensions work and the unusual retirement incentives they create. It discusses some of the unintended consequences of the retirement system, including many districts’ tendencies to rehire pensioners and the increased utilization of retiree health benefits. It also describes recent trends in private-sector retirement benefits and discusses how cash
balance plans that combine features of DC plans and traditional DB plans might better meet the needs of teachers, school districts, and taxpayers. Finally, we consider whether higher education’s experience with financial services company TIAA-CREF provides useful lessons.

Background

The “Standards Revolution” by states in the 1990s and the federal No Child Left Behind Act (NCLB) represent a commitment by states and the federal government to improve school performance and close achievement gaps. Several studies have found that teacher quality is the most important school-based determinant of student performance and that teacher effectiveness varies widely within school districts and even within schools (e.g., Aaronson, Barrow, and Sander 2007; Rivkin, Hanushek, and Kain 2004). This implies that consistent student exposure to high-quality teachers over several years could in principle significantly raise achievement and narrow gaps. Education policy discussions have thus increasingly begun to focus on ways to recruit, retain, and motivate the most effective teachers. This, in turn, has led some to critically examine the structure of teacher compensation.

A focus on teacher compensation is important for two reasons. First, and most obvious, most of the K–12 education dollars go to teacher compensation. During the 2005–06 school year, the most recent year for which national data are available, U.S. public schools spent $187 billion on salaries and $59 billion on benefits for instructional personnel, accounting for 55 percent of total current expenditures for K–12 and 90 percent of instructional expenditures.¹

Retirement benefits figure prominently in this spending, and their share of education costs appears to be rising. Figure 10.1 presents quarterly data from the Bureau of Labor Statistics (BLS) on employer contributions for retirement as a percentage of salaries for public K–12 teachers and comparable data for private-sector “management, professional, and related” employees.² Note that benefits as a percentage of salary for teachers are currently more than twice that of the private-sector professionals.³ While the contribution rate has been relatively flat for private-sector professionals, it has increased for public school teachers.

Differences in Social Security coverage explain part of the observed gap between employer retirement contributions for private professionals and
public school teachers. Both employers and employees in covered jobs are subject to a 6.2 percent Social Security payroll tax on salaries up to a certain limit each year ($106,800 in 2009). These costs are not included in figure 10.1. However, only 73 percent of public school teachers are covered by Social Security, according to the BLS (2008, table 5). The BLS data provide information on employer contributions for Social Security for private-sector professionals but not for public K–12 teachers. We can estimate Social Security contributions for school teachers assuming that 73 percent of public school teacher compensation is subject to the full tax, and the remaining 27 percent is not subject to any tax. Figure 10.2 presents an estimate of the combined employer contributions to employer-sponsored retirement plans and Social Security for the two occupational groups. The gap is narrower under this broader measure of retirement contributions, but the pattern is similar to the one in figure 10.1. The employer contribution rate for private-sector professionals has been relatively flat over the past four years and well below that for teachers. The rate for public school teachers shows a clear upward trend.
The reasons for this divergence cannot be determined from this data source, but the trend is consistent with known patterns of benefit enhancements for teacher pensions (at least until recently) and the private-sector shift toward less-costly defined-contribution plans. Looking forward, there is good reason to believe the divergence will continue to expand as the drop in DB pension fund values since 2007 and the corresponding rise in unfunded liabilities lead to an increase in states’ required contributions to amortize those liabilities.

In addition to the size of these expenditures, a second reason for focusing on the structure of compensation is that a substantial labor economics literature, including studies of teachers, shows that employer compensation policies affect the behavior and composition of the workforce (Baron and Kreps 1999). Most teacher research has focused on current teacher compensation. However, a small but growing literature has begun to focus on the labor market effects of teacher retirement benefit systems (Brown 2009; Costrell and McGee 2009; Costrell and Podgursky...
How Teacher Pensions Work

Public school teachers are almost universally covered by traditional DB pension systems. We call these plans traditional because they were once the norm in both the public and private sectors. However, as noted above, the majority of private-sector employers have now moved to 401(k)-type systems or fundamentally restructured their DB plans. In the traditional DB plan that continues to dominate in the public sector, the employer agrees to provide a regular pension check to employees when they retire and to continue payments until they die.

Most DB teacher pension plans require both teachers and employers to contribute a portion of their salaries each year to a pension trust fund. On average, these contributions are smaller for teachers who are part of the Social Security system and larger for those who are not covered. In the systems covered by Social Security, teachers contribute an average of 4.5 percent to the pension fund and their employers contribute 9.0 percent, for a total of 13.5 percent. This is in addition to the 12.4 percent combined employer and employee contribution to the Social Security system. By contrast, in noncovered systems, teachers contribute an average of 7.8 percent and employers contribute 11.1 percent, for a total of 18.9 percent. The overall average for the joint contribution is 15.6 percent (Costrell and Podgursky 2009b).

Once a teacher is vested in the plan, which usually takes 5 or 10 years, she qualifies for a pension upon reaching a certain age or length of service. Eligibility rules vary, but they typically allow teachers to draw a pension before age 65 (often at age 55), especially if teachers have been working since their early or mid-20s. Teachers who leave the system before vesting do not receive any pension benefits, although the plan typically returns their contributions, with interest.

Benefits at retirement are determined by a formula of the following type:

\[
\text{Annual Benefit} = (\text{years of service}) \times (\text{final average salary}) \times m.
\]

“Final average salary” averages the highest few years (typically three) of salary, and \(m\) is a percentage known as the multiplier. In Missouri, for
example, teachers earn 2.5 percent of final average salary for each year of teaching service. Thus, a teacher with 30 years of service would earn 75 percent of the final average salary. If the final average salary were $60,000, she would receive $45,000 per year, payable for life. Teachers who separate from service before reaching the plan’s retirement age receive deferred benefits that begin once they reach retirement age. Their benefits are frozen until that time and are based on the salary they received when they left, unadjusted for inflation. Once the pension draw begins, it typically increases with inflation, although the exact adjustment varies from state to state.

Table 10.1 summarizes some of the key features of DB pension plans in six states. Although not randomly chosen, they are indicative of many teacher pension plans and cover roughly 29 percent of public school teachers. The National Education Association and other groups publish more complete tables, showing similar state variation in pension parameters (NEA 2004). Although these comparative tables provide useful information about the individual parts of the pension system, they do not tell us about the overall incentive effects of the system on teacher behavior. To appreciate the powerful incentive effects of retirement systems and make informative comparisons across states, we use the data in table 10.1 to examine how teachers accumulate pension wealth with each year of employment.

**Work and Retirement Incentives**

The present value of the future stream of benefits that a teacher receives from a DB plan can be estimated with standard actuarial methods. This pension wealth equals the 401(k) account balance that would generate the same stream of payments if it were converted into a life annuity. The changes in pension wealth over a teacher’s career capture the incentives embedded in the pension system.

Figure 10.3 depicts pension wealth, in inflation-adjusted dollars, for a 25-year-old female entrant to the Ohio teaching force, at various separation ages. Clearly, the accumulation of pension wealth is not smooth and steady but rises with fits and starts after age 49, due to eligibility rules for early retirement and the like. During her first 24 years in the classroom, this teacher accumulates roughly $300,000 in pension wealth. Over the next six years, however, she accumulates more than $100,000 each year,
<table>
<thead>
<tr>
<th>Feature</th>
<th>Ohio</th>
<th>Arkansas</th>
<th>California</th>
<th>Massachusetts</th>
<th>Missouri</th>
<th>Texas</th>
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<tr>
<td>In Social Security Vesting (years)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
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<td>Retirement eligibility (normal or early)</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>10</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Normal: Age = 65 or YOS = 30</td>
<td></td>
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<tr>
<td>Early: Age = 60 or Age = 55 if YOS = 25</td>
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<td>Contribution rates</td>
<td>District 14%*</td>
<td>Employer 14%</td>
<td>Employer 8.25%</td>
<td>State 15.6%*</td>
<td>District 12.5%</td>
<td></td>
</tr>
<tr>
<td>Teacher 10%</td>
<td>Teacher 6%</td>
<td></td>
<td>State 4.52%*</td>
<td>Teacher 11%*</td>
<td>Teacher 12.5%</td>
<td>State 7.98%*</td>
</tr>
<tr>
<td>Multiplier (percent per year of service)</td>
<td>Years 1–30:</td>
<td>2.15% + $300</td>
<td>Linear segments:</td>
<td>Linear:</td>
<td>2.5%, YOS ≤ 30,</td>
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<td></td>
<td>2.2%</td>
<td></td>
<td>1.1% at age 50</td>
<td>0.1% at age 41</td>
<td>2.55%, YOS &gt; 30</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Year 31 only:</td>
<td>2.5%</td>
<td>1.4% at age 55</td>
<td>to 2.5% at age 65</td>
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<td></td>
<td>Normal, or Age = 55: 2.3%</td>
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*Note: * 
- * indicates additional qualifications or conditions.
<table>
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<th>COLA formula</th>
<th>Year 32 only:</th>
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<tr>
<td></td>
<td>2.6%</td>
</tr>
<tr>
<td></td>
<td>For YOS ≥ 35,</td>
</tr>
<tr>
<td></td>
<td>add 9% to total</td>
</tr>
<tr>
<td>3%, simple</td>
<td>3%, simple</td>
</tr>
</tbody>
</table>

| For YOS = 30, |
| add 2% x     |
| (YOS - 24)   |
| Max replace- |
| ment = 80%   |
| 3%, simple, |
| on first $12,000 |

| Early, 25 ≤ YOS < 30: |
| 2.2%, YOS = 25 rising |
| linearly to 2.4%,     |
| YOS = 29              |

| Consumer price index, |
| compound, up to       |
| 1.80 maximum factor   |

| None in statute       |
| (periodic, retroactive) |

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YOS = years of service; COLA = cost-of-living adjustment
a. Includes 1% for retiree health insurance.
b. Contributory members only. Average is 4.8%, including non-contributory.
c. Includes 2.5% for 80% floor on initial purchasing power (see the COLA formula row).
d. Includes 2% for a supplemental defined contribution plan.
e. Calculated from fiscal year 2007 state appropriation.
f. For all teachers hired since 2000.
g. Includes 1.4% for retiree health insurance.
h. Includes 0.5% for retiree health insurance.
approaching the million-dollar mark by age 55. Pension wealth peaks in her early 60s and then declines.

This chart and related calculations clearly indicate the penalties for teacher mobility in a DB pension system. A teacher who separates after 15 years of teaching at age 40 has an annuity that she can begin collecting at age 60. The present value of this annuity is worth about 13 percent of her cumulative earnings—that is, the joint contribution that would be required to fund the annuity. By contrast, if she were to work for 30 years, she could begin collecting her annuity immediately at age 55, and the present value of that annuity would be worth about 38 percent of her cumulative earnings. Thus, the 15-year teacher’s pension wealth is only one-third the magnitude of the 30-year teacher’s, even controlling for cumulative earnings.7

The next set of charts provides a useful tool for analyzing retirement incentives. These charts show the change in pension wealth from an additional year of work, expressed as a percentage of salary, for Ohio and the five other states. They measure deferred income earned each year (net
of interest earned on prior pension wealth and net of employee contributions), received on top of a teacher’s current salary. Behind each of these spiky charts is a pension wealth accrual chart such as figure 10.3.

Consider Ohio, depicted in figure 10.4. A teacher who enters service at age 25 accrues virtually no pension wealth during her early years on the job, net of her own contribution. Her deferred income gradually rises to 23 percent of annual earnings in her 24th year (at age 49). Her 25th year of experience yields a sudden large increase in pension wealth, as it jumps by 164 percent of her annual earnings. Each of the next five years also yields deferred income that approaches or exceeds her current income. The growth in pension wealth drops off sharply over the next few years, turning negative for ages 56–59, followed by another sharp spike at age 60 (when she has accumulated 35 years of experience), equal to 132 percent of her salary that year. Beyond age 60, pension wealth shrinks once again, and at an accelerating rate.

**Figure 10.4.** Deferred Income per Year as a Percentage of Salary, Ohio: Net Addition to Pension Wealth from an Additional Year of Teaching

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Notes: Age of first pension draw indicated. Assumptions: 2007–08 Columbus salary grid, inflating at 2.5%; interest rate = 5%; female 2004 CDC Mortality Table. Addition to pension wealth is net of interest on prior wealth and net of employee contribution.
Changes in pension wealth for our representative teachers in Arkansas, Missouri, California, Massachusetts, and Texas are depicted in figures 10.5 through 10.9. Note that four of these five states have spikes at age 50 or 55 (25 or 30 years of service), of varying magnitude. Arkansas’s spike is unusually large (465 percent), indicating that a teacher in that state earns almost five times her salary in additional pension wealth during her 25th year of service. Missouri’s spike at the 25th year of service is not as large, but there are large accruals for other years as well. The spikes in California and Massachusetts are smaller, and they were only created relatively recently by formula enhancements in 1999 and 2001. In the case of Texas, shown in figure 3.9, there used to be spikes at ages 45 and 52, but recent changes have eliminated them for new teachers.

What causes pension wealth to spike in certain years and then decline? At first blush one might expect pension wealth accrual to be fairly steady over time. After all, both the teacher and employer contribute the same percentage of pay year after year. But that is the wrong way to think.

Figure 10.5. Deferred Income per Year as a Percentage of Salary, Arkansas: Net Addition to Pension Wealth from an Additional Year of Teaching

![Graph showing deferred income per year as a percentage of salary.](source: Costrell and Podgursky (2009b).

Notes: Age of first pension draw indicated. Assumptions: 2007-08 Little Rock salary grid, inflating at 2.5%; interest rate = 5%; female 2004 CDC Mortality Table. Additions to pension wealth is net of interest on prior wealth and net of employee contribution.)
Figure 10.6. Deferred Income per Year as a Percentage of Salary, Missouri: Net Addition to Pension Wealth from an Additional Year of Teaching

Source: Costrell and Podgursky (2009b).

Notes: Age of first pension draw indicated. Assumptions: 2007–08 Jefferson City salary grid, inflating at 2.5%; interest rate = 5%; female 2004 CDC Mortality Table. Addition to pension wealth is net of interest on prior wealth and net of employee contribution.

about teacher pension wealth, because it is only loosely tied to contributions. Fluctuations in pension wealth are driven primarily by changes in annual annuity payments (as determined by the benefit formula given above) and the number of years that teachers can expect to collect. The expected duration of benefit receipt is the wild card in these systems.8 Once teachers pass the spike (or spikes), pension wealth accrual turns negative. This is not because the annual pension annuity falls; in fact, it is rising. Rather, pension wealth falls each year beyond the spike because the teacher collects the pension for one fewer year and the annual payment is not enhanced sufficiently to offset this loss.

Spikes in pension wealth accrual create two key incentives for teachers—a pull factor and a push factor. First, teachers have strong financial incentives to stay on the job until they reap the benefit of the spikes. Even if a teacher is no longer suited to the job, it may be worthwhile to “put in one’s time” for a few more years to collect several hundred thousand dollars in pension wealth. Second, once a teacher is beyond the spike and into
the region of negative deferred compensation, the pension system creates a disincentive to stay on—a push out the door—even if she excels at her job. There is ample evidence that such incentives affect behavior. Anecdotal evidence abounds of teachers (and others) timing their retirement decisions to maximize pension benefits. Pension plans routinely provide online calculators to help their members do so. Labor economists have developed more-systematic evidence of the behavioral impact of DB pensions in other fields, particularly in the private sector (Asch, Haider, and Zissimopoulos 2005; Friedberg and Turner 2009; Friedberg and Webb 2005; Lumsdaine, Stock, and Wise 1997; Samwick 1998; Stock and Wise 1990). There has been less research on teacher pensions, but the available evidence indicates strong effects on retirement timing (Brown 2009; Costrell and McGee 2009; Furgeson, Strauss, and Vogt 2006; Ni, Podgursky and Ehlert 2009; Podgursky and Ehlert 2007)."
Figure 10.8. Deferred Income per Year as a Percentage of Salary, Massachusetts: Net Addition to Pension Wealth from an Additional Year of Teaching

Source: Costrell and Podgursky (2009b).

Notes: Assumptions: 2007–08 Boston salary grid, inflating at 2.5%; interest rate = 5%; female 2004 CDC Mortality Table. Addition to pension wealth is net of interest on prior wealth and net of employee contribution.

shortening professional careers. For example, the median retirement age for teachers is just 58 (Podgursky and Ehler 2007). Interestingly, the emphasis on deferred income in teachers' compensation packages was originally thought to serve the public interest by promoting long tenures (NEA 1995).\textsuperscript{10}

Employing Retired Teachers

Although teacher pension systems often create strong financial incentives for teachers to retire at relatively young ages, many teachers, even those who nominally retire in their 50s, will continue to work into later life.
Figure 10.9. Deferred Income per Year as a Percentage of Salary, Texas: Net Addition to Pension Wealth from an Additional Year of Teaching

Source: Costrell and Podgursky (2009b).
Notes: Assumptions: 2007–08 Austin salary grid, inflating at 2.5%; interest rate = 5%; female 2004 CDC Mortality Table. Addition to pension wealth is net of interest on prior wealth and net of employee contribution.

Given concerns about teacher shortages and pressures from the No Child Left Behind Act to ensure that qualified teachers staff all classrooms, it makes little sense, on educational grounds, for districts to nudge effective teachers out the door at such early ages. Not surprisingly, all these teacher pension systems have provisions allowing educators to collect their pensions while continuing to teach.

This practice of postretirement reemployment seems to have gained in popularity (at least until recent funding difficulties created pressures to restrict this practice). Here are some examples.

- **Part-time employment.** All the pension systems considered here allow retired teachers to continue working part time in covered employment (without accruing additional benefits).
- **Employment in shortage areas.** Many states permit retired educators to teach full time for a specified period in certain fields that lack enough qualified teachers.
- **Breaks in employment.** Some states allow teachers to return to full-time employment and collect their pensions after a specified break
in service. California requires a break of 12 months. In Ohio, a teacher can return to work the day after she retires but must wait two months before receiving pension benefits.11

- **DROP plans.** Many states have implemented deferred retirement option plans (DROPs), which permit teachers to continue working full time for a specified period (1 to 10 years), during which all or most of their pension check goes into the equivalent of an individual retirement account.12

Of course, nothing prevents retirees from working in other fields or from continuing teaching in other states or districts that belong to different pension systems. For example, Missouri teachers in the state pension system can retire and teach full time in the St. Louis or Kansas City systems, or a Kansas City, Missouri, teacher can cross the border and teach in Kansas City, Kansas.

All these practices mean that the decision to “retire” (i.e., collect a retirement check) is not necessarily a decision to quit teaching in public schools. We are not aware of any comprehensive national data measuring the number of teachers who work while collecting pensions. Data for Missouri teachers indicate that 15 percent of those who retired between the 2001–02 and 2006–07 school years worked at least one year (part or full time) after retirement (Podgursky and Ehlert 2007).

The significance of these practices has not been fully examined. At a minimum, these practices blur the distinction between current and deferred compensation, since employed teachers are collecting a paycheck and a retirement check. This practice of double dipping may well be a rational response to an irrational system that pushes effective teachers into early retirement (along with ineffective teachers). However, the system as a whole does impose costs on taxpayers. As reemployment becomes easier, the incentive to “retire” at or near a pension spike becomes more pronounced—there is no downside to retirement if employment can continue—and this raises the cost to taxpayers. Allowing teachers to double dip may also be in a district’s interest if pension costs are borne by the state, because new teachers cost the district less than older ones. This also raises taxpayers’ cost, especially in cases where the entity that makes the employment decision (the district) does not incur the full cost of the decision.

This practice has no parallel in the private sector, because early retirement incentives there are always part of a downsizing effort, not one that offers reemployment. In higher education,
ingly TIAA-CREF) predominate, some colleges have encouraged "phased retirement," moving professors to half-time employment status with a commensurate reduction in pay, but continuing to maintain contributions to the retirement plan based on full-time equivalent earnings. In general, partial retirement is easier to implement in a DC-type system. Also, in contrast to the typical teacher pension system, pension wealth in a DC (or cash balance) plan never falls simply because participants choose to continue working. Thus, there is no work penalty or tax to offset. The costs and benefits of phased retirement are far more transparent (Clark 2004).

**Retiree Health Insurance**

Another consequence of early teacher retirement is the increased demand for retiree health insurance coverage. Teachers who retire in their 50s must wait several years to qualify for Medicare at age 65. Because individual health insurance policies are quite expensive at older ages, many school districts and states have extended health insurance coverage to retirees. Unlike teacher pensions, retiree health benefits are typically funded on a pay-as-you-go basis. Instead of creating a fund to cover future liabilities, states pay for benefits out of current tax revenue as they are incurred. However, new government accounting rules (GASB 45) now require districts to estimate these liabilities in their financial statements. Initial indications suggest that the figures are staggering. For example, the Los Angeles Unified School District, which provides complete health insurance coverage to all retirees, estimates its unfunded retiree health liability at about $10 billion (Standard and Poor’s 2007). A recent report by the Cato Institute estimates that the unfunded liabilities of state and local governments under GASB 45 could total $1.4 trillion (Edwards and Gokhale 2006).

Clark (2009) has gathered the available information on teachers’ retiree health plans and liabilities from all states. In many states, the liabilities for teachers are not readily distinguished from those of other public employees. There is also wide variation across states in the magnitude of the liabilities, because some states heavily subsidize retiree health insurance and other states do not.

The consequences of early teacher retirements for publicly funded health liabilities have not yet been studied. However, it seems clear that taxpayer costs increase as early retirement boosts the total number of
people—active and retired—who rely on the school system for health insurance.

**Legacy Cost Burdens on Taxpayers and New Teachers**

In addition to the powerful incentive effects on teacher retirements, the retirement benefit system's growing costs are absorbing a progressively larger share of current per-student educational spending. Whether this is the most effective way to structure teacher compensation to recruit and retain young teachers is open to question. Moreover, a significant component of employer contributions does not even go to future benefits for active teachers, but instead is a "legacy cost" for unfunded employer liabilities on behalf of previous cohorts of teachers.

When a retirement system is fully funded, benefits for each generation of teachers are fully financed by contributions (and the investment returns they earn) made over the career of the teacher by the school district, state legislature, and the teachers. Yet many teacher retirement systems have large unfunded liabilities. The most recent available estimates of unfunded liabilities (and funding ratios) for pension funds in the six states considered in this study are $1.8 billion (85.3 percent) for Arkansas (June 30, 2007), $18.7 billion (88.8 percent) for California (June 30, 2007), $9.3 billion (72.2 percent) for Massachusetts (including Boston, January 1, 2008), $5.7 billion (83.4 percent) for Missouri (June 30, 2008), $18.2 billion (79.1 percent) for Ohio (June 30, 2008), and $11.5 billion (90.5 percent) for Texas (August 31, 2008). All these estimates predate the plunge in pension fund values from fall 2008 through early March 2009 (the date of current writing).

These unfunded liabilities mean that employer and teacher contributions must not only cover the currently accruing liabilities for the active teacher's future retirement (known as "normal costs"), but also be used to pay down the debt on retirement benefits for prior generations of teachers. These legacy costs are considered part of the employer's contribution (since employees can always recoup their contributions). Thus, they represent additional taxpayer burdens or expenditures that are not available to compensate new teachers.

For example, in the Missouri teacher pension system, normal cost—the percentage of payroll required to fund benefits accruing for current
teachers—was 21.7 percent in fiscal year 2008. The combined employer and employee contribution, however, was 26 percent that year. Thus, an amount equal to 4.3 percent of payroll was diverted to pay legacy costs. The corresponding figures for employer contributions in other states to amortize the unfunded liabilities were 2.6 percent in Texas, 8.8 percent in Ohio, and 5.5 percent in Arkansas. California’s actuaries calculate the amortization two different ways, reaching estimates of 0.5 percent and 4.1 percent. In Massachusetts, the state’s contributions to amortize the unfunded liabilities totaled 14.3 percent of payroll in fiscal year 2008, making up the vast majority of the state’s 16.3 percent contribution that year. Again, these amortization rates predate the recent drop in pension fund values. Barring a rapid recovery in equities, we would expect these amortization rates to rise over the next several years.

Reform Lessons from the Private Sector and Higher Education

The private sector has faced similar, although not identical, issues, so developments there are instructive, especially because public K–12 education competes with the private sector for talent. As noted earlier, many private-sector employers have switched from DB to DC retirement plans, whereas nearly all public school districts continue to offer traditional DB pension plans. There is also some evidence that the private-sector DB plans that remain are less generous than teacher plans. Although cost cutting is undoubtedly a major driver of developments in the private sector, the potential lessons for K–12 lie instead in the more rational structure of benefits and incentives that prevail in the private sector.

DC plans do not promise specific retirement benefits, conditioned on specified eligibility rules. Instead, employers offering 401(k)-type plans—the most common type of DC plan—set up retirement accounts in the employee’s name and make regular contributions, usually as a percentage of salary. Employees can also contribute to their retirement accounts and defer taxes on their contributions until they withdraw funds from their accounts. Employer contributions sometimes depend on how much the participant contributes. Some employers, for example, match worker contributions up to a certain amount. Account balances grow over time with contributions and investment returns, and employees receive the funds in their accounts when they separate from their employer.
Unlike defined-benefit plans, defined-contribution plans do not encourage early retirement or penalize workers who change jobs. Because the plan benefit is simply the account balance, DC plan benefits may continue to grow as long as the worker remains with the employer and contributes to the plan. Workers do not forfeit a monthly benefit check if they remain on the job for a month after the plan’s retirement age. Instead, account balances grow smoothly with plan contributions, except for variations arising from fluctuating investment returns (discussed below). Consequently, DC plans do not create financial incentives for workers to retire at certain ages, by plan design. DC plan participants have been found to retire about two years later than their counterparts with traditional DB pensions (Friedberg and Webb 2005). As a result, DC plans are well suited to employers that wish to retain older workers as population aging limits the available pool of younger workers.

Additionally, DC plans do not penalize workers who frequently change jobs. Workers in DC plans who leave their jobs before retirement can take their accounts with them or keep them at their old employer. Either way, the balances will continue to earn investment returns until participants cash them out. Traditional DB plans, by contrast, penalize workers who leave their jobs at young ages, because they forfeit the sizable benefit increases that occur when the pension wealth accrual spikes at certain ages, and their benefits remain fixed at the level they attained at the time of separation, eroding over time with inflation.19

One drawback of DC plans is that they may expose workers to substantial investment risk, as we have recently seen. Bad luck or poor investment choices—either by investing in overly risky securities or by investing too conservatively—may leave participants with insufficient retirement benefits. This can also affect the timing of retirement decisions. The riskiness of DC plans may be especially worrisome to public-sector workers, including teachers, who appear to be more risk averse than private-sector workers (Munnell, Haverstick, and Soto 2007).

An increasingly popular alternative to DC plans and traditional DB plans is the cash balance plan, a hybrid that combines features of both plan types (Johnson and Uccello 2004). Employers with cash balance plans set aside a given percentage of salary for each employee and credit interest on these contributions. Interest rates are generally tied to some benchmark, such as the U.S. Treasury bill rate. Benefits are expressed as an account balance, as in DC plans, but these balances are only bookkeeping devices. Plans pay benefits, either as a lump sum or annuity, from com mingled
funds invested in a pension trust on behalf of all participants. Cash balance plans are considered DB plans for legal and regulatory purposes. In 2005, 25 percent of all private-sector workers in DB plans were covered by cash balance plans, not traditional DB plans (BLS 2007a).

The key advantage of cash balance plans is that they do not create retirement incentives at certain ages. The plans’ neutrality on separation age may be simply depicted. In the pension wealth accrual graphs (figures 10.3–10.9), the lines with spikes would be replaced with flat lines, at a percentage given by the employer contribution. There are no spikes that induce teachers to stay until their mid-50s and then leave. Pension wealth never declines: If a teacher wants to work another year, the account grows by the contributions, plus the investment return, which can be converted to an annuity at retirement. (All private-sector cash balance plans must include an annuity option.) If a teacher works another year, the starting annuity is increased in an actuarially fair manner, because there is one less year of retirement to cover.

Such a retirement-neutral plan leaves the employee with much more latitude to arrive at an individually optimal separation decision, based on his or her lifestyle preferences. It also makes it much easier for schools to tailor their workforce to the educational needs of their students. In our view, this is preferable to the heavy-handed DB formulas, supplemented by makeshift DROP formulas or other reemployment provisions.

Another potentially relevant model for K–12 retirement reform may be found in higher education. TIAA-CREF, established in 1918, represents a popular and effective system that provides lifetime annuities and retirement security, as well as transparency and complete mobility of retirement benefits, to several million faculty and other employees in roughly 15,000 nonprofit institutions. Some private K–12 school teachers participate as well. Although nominally a DC plan, TIAA-CREF has avoided many problems associated with such plans. Administrative costs are very low, members have relatively few investment choices, and annuity payout options are the norm. By providing a guaranteed annual return combined with an annuity payout, TIAA-CREF more closely resembles a cash balance DB plan, in that downside market risk continues to be borne by the plan (Greenough 1990).

Finally, recent private-sector experience with retiree health benefits may be instructive for public school districts. Many private-sector employers have cut back or eliminated retiree health benefits as health care costs have
increased. Between 1988 and 2006, the share of large private-sector employers (with 200 or more employees) that offered retiree health benefits fell from 66 to 35 percent (Kaiser Family Foundation and Health Research and Educational Trust 2006). In 2003, only 25 percent of private-sector workers were employed at firms that provided retiree health benefits (Buchmueller, Johnson, and LoSasso 2006). In addition, firms that continue to offer retiree health benefits have increasingly shifted costs to retirees. For example, between 1994 and 2004, the median monthly contribution for retiree health benefits by retirees age 55 to 63 increased from $25 to $111 (in inflation-adjusted 2004 dollars; Johnson 2007).

Unlike pensions of current public employees, which are protected by state law or constitutions, retiree health benefits for public employees are not generally protected by the state. Consequently, there are some indications that more public employees and their employers will face difficult choices of whether to continue retiree health benefits and at what cost. This scenario is particularly likely for teachers, to the extent that their early retirements make retiree health benefits more costly. For example, in 2007 the Ohio Teacher Retirement System proposed raising employer and employee contribution rates by 2.5 percent each, to continue to be able to offer subsidized retiree health insurance.20 It was strongly implied at the time that if the proposal were to fail—and there was significant opposition from the school districts—benefits would be discontinued.21

**Teacher Quality**

We have discussed extensively the peculiar incentive structures built into teacher pension systems and some of their consequences for school staffing. In this section, we consider the consequences of these pension systems for teacher quality. Our discussion is brief and speculative because there is no experimental or quasi-experimental literature in teaching on which to draw. Thus, we must rely on findings from other sectors and analyze bits of available evidence within teaching.

First, limited evidence suggests that young teachers are not particularly well informed about their pension benefits. For example, DeArmond and Goldhaber (2009) find that only about one-third of Washington State teachers who were covered by a hybrid DB/DC plan knew that they were. A small sample of young teachers in a selective policy fellows program
found that 40 percent had "little or no understanding" of the Massachus-
etts teacher pension plan (Tran and Huang 2009). These limited data for
teachers seem credible since they are consistent with findings of poor
retirement benefits knowledge among young workers generally (Gustman
and Steinmeier 1999).

On its face, this lack of knowledge would suggest that changing the
level of benefits within a conventional DB system would have little effect
on recruitment of young teachers, since the latter are mostly unaware of
the benefit. Indeed, young teachers may be rationally ignorant of these
benefits since they occur far in the future, and a large percentage of these
teachers may never collect these benefits.22

The question for benefit reform is whether shifting to more-transparent
forms of pension benefits, such as DC or cash balance, would raise the
prospective value of those benefits to young teachers and potential recruits,
for the same overall cost. Unfortunately, there have been no policy studies
of the few cases where teachers have been able to choose DC plans.23

Vigdor (2008) has noted that, compared with other professions, teacher
salary gains are relatively back-loaded. In other professions, salaries rise
more rapidly at the beginning of a professional career. We have seen that
accrual of pension wealth is highly back-loaded as well. Teachers who leave
a plan before traditional retirement age, or who work a full career but
switch plans, face very sharp reductions in pension wealth relative to
teachers who work full careers in a single plan. Costrell and Podgursky
(2009a) analyze a sample of state teacher plans and find that about half an
entering teacher cohort's net pension wealth is redistributed to teachers
who separate in their 50s from those who separate earlier, compared with
a fiscally neutral cash balance plan. Similarly, they find that teachers who
split a 30-year career between two pension plans often lose more than half
their net pension wealth compared with teachers who complete a career in
a single system.

Once teachers are vested and have accumulated roughly 10 years of
experience, it is likely that these mobility penalties act to lower teacher
turnover. In a comparison of teacher turnover to that of nurses, social
workers, and accountants, Harris and Adams (2007) find that teacher
turnover rates fall below those of the other professions by the time a
teacher reaches age 40 (controlling for teacher demographics). From self-
reported data on pension coverage, Harris and Adams conclude that the
turnover reduction effect of teacher pension coverage is larger than in
those other professions. Evidence from other sectors, cited in Friedberg
and Turner (2009), also finds that average worker tenure rises when DB plans are in place. While DB plans may have the effect of lowering turnover of younger or mid-career teachers, it is unlikely that this produces much of a teacher quality gain, since most researchers find that the returns for experience are negligible beyond the first few years on the job (Hanushek 2003).

Unfortunately, from a policy point of view, no experiments compare the teacher quality effects of traditional pension plans with those of well-designed alternatives. The current system does not permit "regulatory space" for such experiments. Although school districts are free to experiment with other aspects of teacher compensation, such as performance pay (and many do), they lack the flexibility to experiment with teacher pension systems. Ideally, what we would want to see is a comparison of the labor market effect of identical compensation packages structured differently. Following Vigdor (2008), one package would front-load more salary and trim deferred benefits. Other packages might hold the overall mix of deferred and current compensation constant but provide teachers with retirement plans that are portable and have smoother wealth accrual over a teaching career, such as DB or DC. In all the experiments, the goal would be to assess the effect on teacher recruitment and workforce quality.

Conclusions and Reform Principles

Policy discussions about teacher recruitment, retention, and quality usually focus on salary, but retirement benefit systems can also have important consequences for the teaching workforce. Pension benefits may seem distant and uncertain to young teachers, especially because many young workers change jobs frequently. Pension costs, however, are incurred from the start as employers and employees make plan contributions that together average more than 15 percent of salary and sometimes exceed 20 percent. Many young teachers, who are paying off student loans, starting families, and buying homes, might prefer to receive more of their compensation up front rather than have it diverted into a system that may never benefit them. In addition, as some young teachers contemplate leaving teaching for another career—or taking a career break to start a family, perhaps returning to work in another state—the mobility penalties in a DB system may seem more salient.
A new or reworked retirement system could better serve the needs of teachers, school districts, and taxpayers. It should embody the following key features:

- **Neutrality.** Each additional year of work should add pension wealth in a fairly uniform way. There should be no spikes or cliffs in pension wealth at any particular year of service. Longevity decisions by individuals and their employers should be based on other grounds more directly connected to education needs and personal priorities.
- **Transparency.** The accrual of benefits should be simple and clear. Teachers should not have to rely on consultations with retirement counselors (typically late in one’s career) to understand the implications of life choices. Entry-level teachers should be able to see what benefits they will be accruing from the beginning of their career.
- **Portability.** Many young professionals change jobs frequently, which has led many private-sector employers to move toward systems that do not penalize mobile young workers. The current DB systems offer few, if any, benefits to mobile young teachers and allocate the lion’s share of benefits to high-seniority incumbents. Portability may help attract energetic, talented individuals who could add much to the teaching force. This might include mid-career switchers, such as engineers and other technical workers who could make valuable math and science teachers but are harmed by vesting rules. It might also assist in recruiting recent college graduates with math and science majors. A teacher who worked for 10 years in Missouri at a starting pay of $30,000 would amass $82,000 (adjusted for inflation) in a retirement account if she could take her employer and employee contributions with her when she left.28
- **Sustainability.** The pension system should be self-funding. It should not follow a pattern of benefit enhancements when the stock market is up, followed by funding shortfalls and contribution hikes when the market sours. Individual benefits should be tied to contributions by and for the individual teacher. The disconnect between contributions and benefits is the source of much legislative mischief, allowing costs to be shifted to future generations of taxpayers and teachers.

A DC system satisfies all these conditions far better than the traditional DB teacher pension systems, although it shifts market risk to the teacher. Cash balance systems also satisfy the conditions above, but without shift-
ing risk. Alternately, TIAA-CREF, a DC system with some cash balance features, has for decades provided retirement benefits for mobile higher education faculty and researchers at thousands of colleges, universities, and nonprofit research institutions. To attract and retain a talented teaching workforce, particularly given the job mobility of educated workers in today’s labor market, states need to consider such reforms to their retirement benefit systems.

Shifting to cash balance formats or DC plans, and thus eliminating the tilt in benefits against short-timers, will almost certainly reduce benefits for some while raising benefits for others and may also be more expensive overall, depending on how generous the new program is. The point here is not so much the generosity of current plans, but their idiosyncratic structure, resulting in very uneven distribution of benefits and strong incentives to time career decisions to arbitrary plan parameters. In our view, that is the most compelling reason for considering pension reform.

Education policymakers should at least consider experiments that provide alternatives to traditional DB plans for new teaching recruits and evaluate their utility in recruitment and retention of high-quality teachers. Indeed, if new recruits are provided with actuarially fair choices among alternative retirement plans, the incremental costs to states and districts should be modest. Even if many teachers continue to choose the traditional DB option, providing new recruits and career-changers (particularly in areas such as math and science) with choices may, at the margin, help attract some of the most mobile and academically gifted candidates who have the best nonteaching options.

NOTES

1. For some teachers, the combination of Social Security and pension benefits can exceed preretirement earnings.


4. In dollar terms, the comparison of retirement costs depends on whether one considers hourly, weekly, or annual compensation. This mirrors the well-known (and
much debated) comparisons for total employer costs. See Costrell and Podgursky (2009c, unabridged, 10–12).


7. If we net out the employee’s contribution (10 percent of earnings), the relative disparity is even greater: The 15-year teacher’s net pension wealth is 3 percent of cumulative earnings, one-ninth of the 28 percent figure for the 30-year teacher. In fact, it takes 11 years for the teacher’s net pension wealth to cross into positive territory at all, as compared with simply taking out the money that the employee has put in. For a more complete analysis of the costs of mobility, see Costrell and Podgursky (2009a), where it is estimated that the cost of mobility in Ohio for a teacher splitting a 30-year career is 74 percent of the pension wealth she would have attained by staying in the state. For the other states analyzed, the mobility cost ranged from 41 to 74 percent.

8. For a detailed analysis of how these formulas work, see Costrell and Podgursky (2009b).


10. As the NEA report points out, however, this purpose has “been lost for many in the mist of time . . . Many pension administrators would be hard-pressed to give an account of why their systems are structured as is except to say that ‘the legislature did it’ or ‘it is a result of bargaining’” (1995, 3).

11. The Federal Pension Protection Act of 2006 will require states to lengthen such breaks in employment by January 1, 2011, to continue receiving preferred tax treatment.

12. See Costrell and McGee (2009) for an analysis of Arkansas’ T-DROP system, which is particularly important in that state for mitigating the sharp incentives to retire after 28 years of service, as depicted in figure 10.5.

13. In 2004, the Government Accounting Standards Board (GASB) finalized GASB 45, a new accounting standard requiring state and local governments, public colleges and universities, and school boards to report costs associated with retiree health benefits (and other nonpension post-employment benefits) over the service time of employees, rather than as the current year’s cash outlay. The new rules went into effect in December 2006 for large entities and in December 2008 for smaller jurisdictions.


15. These data are from the comprehensive annual financial reports for each of these pension funds, downloaded from their web sites. These liabilities do not include unfunded retiree health benefits.

16. These figures are updated from those reported in Costrell and Podgursky (2009b). The calculation for Massachusetts is based on Commonwealth Actuarial Valuation Report, January 1, 2008, pp. 8 and 11.
17. The BLS reports that the average replacement factor is 1.59 percent for those private plans with constant multipliers, and that the median falls between 1.50 and 1.74 percent (BLS 2007a). For public school employees in such plans, the median replacement factor is 2.00 percent (BLS 2008). One caveat is that only 43 percent of privately covered employees belong to plans with constant multipliers (most of the others vary with service or earnings), compared with 85 percent of public school employees. Another caveat concerns Social Security. For teachers covered by Social Security—and thus comparable to private-sector employees—we roughly estimate that the average replacement factor is 1.86 percent; for those not covered, we estimate an average of about 2.36 percent, and 2.05 percent overall.

18. The Internal Revenue Service imposes a 10 percent penalty on most withdrawals before age 59 1/2.

19. See Costrell and Podgursky (2009a) for fuller analysis of the costs of mobility under teacher DB plans.

20. A portion of the increase was also slated to shore up the pension fund (Costrell and Podgursky 2007).

21. Two years later, as this book went to press, the Ohio Teacher Retirement System shifted its proposed contribution hike entirely to the pension fund because of the suddenly more urgent problem of pension underfunding.

22. Most states enhanced benefits significantly over the past decade, and the enhancement rate varied significantly between states (Clark and Craig 2009). Unfortunately, there has been no analysis to date of the teacher workforce quality effects of these changes.

23. New teachers in Ohio and Florida have the choice of a DB or DC plan. All teachers in Alaska are placed in a DC plan. Several other states have hybrid plans, in which teachers can choose to put their contributions into a DC plan. See Hansen (2009).

24. This estimate assumes starting pay growth of 3 percent per year and a 5 percent annual return on pension assets.

REFERENCES


BLS. See Bureau of Labor Statistics.


NEA. See National Education Association.


