TEACHER PENSIONS

A Background Paper

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SUMMARY

Pensions are an important but comparatively unexamined component of human resource policies in education. In an increasingly competitive world where employees are more mobile than ever, pension policies that were designed in the last century may be out of step with the needs of both individuals and schools.

This background paper aims to foster understanding and informed discussion of public education pensions. It describes the current system; examines concerns about funding, sustainability, equity, and effectiveness; and discusses pension plan structures and some options for pension plan redesign.

Teachers (like most state and local government employees) are still covered largely by defined benefit pensions based on their final salaries and length of service. Such pensions have been replaced in many private sector firms by defined contribution plans. The legal and economic context is, however, substantially different for public and private sector pensions. Notably, a sizeable minority of public sector employees are not covered by Social Security retirement benefits.

State and local government pensions are "prefunded" to varying degrees. While most plans currently have some unfunded liabilities, analysts do not foresee a broad financial crisis in the public pension arena. (Retiree health care benefits, which are not the subject of this paper but are almost entirely unfunded, are another matter.) Public pensions do, however, face some threats to their financial sustainability caused, for example, by employers' failure to make actuarial required contributions and by the future stresses that other unfunded commitments such as retiree health care will place on state and local governments.

Distinct from the question of whether teacher pension plans are financially sustainable is the question of how fairly they treat all teachers they serve and what if any effect they have on schools' ability to find qualified staff. While traditional defined benefit plans with their back-loaded benefits treat long-serving teachers well, they tend to short-change individuals who do not work a full career in teaching or who move from state to state. The structure of teacher pensions may not only be inequitable for individual teachers but can contribute to teacher shortages by discouraging people from moving to schools where their skills and knowledge are most needed.

The debate over whether public pensions need to be redesigned has frequently taken the form of an argument over whether defined benefit pensions should be replace by defined contribution plans. Framing the question in this way obscures the fact that the boundaries between various types of pensions are porous, and plans can be designed to include a variety of features depending on the objectives being sought. Once these objectives are defined, various plan types and features can be examined with an eye on whether existing arrangements or some new combination would best meet those objectives. This paper raises some questions about objectives for teacher pension plans that merit re-examination, offers an initial look at some of the options available for rethinking teacher pension design, and describes one option (the defined benefit cash balance plan) that to date has received little attention in the public sector.

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I. INTRODUCTION

Twenty-five years into the education reform era launched by the 1983 report *A Nation at Risk*, policymakers continue to search for effective ways to address the persistent challenges of increasing student performance and closing achievement gaps. While much attention has been focused on creating standards and implementing assessment and accountability systems, there is a growing awareness that public policies affecting the staffing of schools also need reconsideration. Many businesses have recognized the importance of adapting their human resource policies to attract and retain talent in a more competitive environment where workers are more mobile than ever before. Public education faces the same imperative but has been slower to recognize that human resource policies created in the last century may no longer be adequate.

Human resource (or "human capital") policies in education span a variety of topics. A rough categorization might include:

- "Pipeline" policies: pre-service training, certification, hiring, assignment
- In-service training policies: mentoring, professional development, leadership development
- Compensation policies: pay, promotion, pensions
- Policies affecting workplace conditions: professional autonomy, principal leadership, student discipline, safety, condition of facilities

All of these areas must be addressed if schools are to be staffed with the high quality teachers and principals that they need to ensure that instruction is as effective as possible. Reformers are increasingly recognizing the need to develop a "strategic human capital management" approach to meet this challenge.

This paper examines one important but relatively unfamiliar element of human resource policy for teachers: pensions. Teachers (along with police officers and firefighters) were the first public sector employees to be covered by retirement plans. The earliest teacher retirement systems were established in the second half of the 19th century.[1] Today, virtually all public school teachers participate in public pension plans operated by state (or a few large city)

governments. Retirement benefits are an important component of the compensation that teachers receive and are a significant budget item for the public sector employers who contribute to them. Nevertheless, pension policies are little understood by those outside education, even though citizens as well as educators have a strong stake in ensuring that public schools have effective tools for attracting and retaining high-quality employees.

There are several reasons to ask whether existing teacher pension policies are serving either teachers or the public as well as they could. The most salient issue, given widespread concerns about the solvency of the federal Social Security program and some public and private pension plans, is whether teacher pensions as currently designed are likely to be financially sustainable. Less visible, but perhaps even more important, are questions about whether current and potential teachers are equitably and effectively served by the existing structure of retirement benefits and whether today's retirement plans enhance or undermine school districts' efforts to meet their staffing needs.

This paper is intended to foster public discussion of these issues by providing an overview of teacher pension plans. The paper does not make recommendations but is intended to inform those who are interested in thinking about the adequacy of existing policies and about whether changes are needed given specific state and local needs and requirements.

The remainder of the paper begins in Section II with some comments about the larger context of discussions of teacher pensions, including the major shift in pension plan design that has occurred in the private sector and key differences in the legal and economic environments in which public and private pensions operate. In Section III current teacher pension plans are described and compared. Section IV discusses the funding and sustainability of existing plans. Section V examines the winners and losers under current pension designs. Section VI concludes with a discussion of the growing overlap between previously distinct pension plan structures and presents some options for pension plan redesign.

So-called "other post-retirement employee benefits" are not the subject of this paper, although (as will be noted at several points) retiree health benefits in particular pose significant financial challenges for public sector employers. These employers may find that previously affordable liabilities incurred in teacher pension plans will be less sustainable in the future in the face of their large and largely unfunded retiree health care commitments.

II. THE LARGER CONTEXT: PRIVATE AND PUBLIC SECTOR PENSIONS

Private and public sector employees (if they had pension coverage at all) traditionally participated in relatively similar kinds of pension plans. In recent decades, however, they have seen their plans diverge quite dramatically. The fact that many private employers have significantly altered the type of pension coverage they offer their workers is one reason why some observers wonder whether similar changes would be desirable in the public sector.

Private and public sector pension plan types and participation

Historically, employers who offered pension coverage did so through "defined benefit" plans. In such plans, employers guarantee employees a specified annual retirement benefit based on a formula. The formula was generally one of three types, as described by the Employee Benefit Research Institute[2]:

- *Flat-Benefit Formulas*—These formulas pay a flat dollar amount for each year of service recognized under the plan.
- *Career-Average Formulas*—There are two types of career-average formulas. Under the first type, participants earn a percentage of the pay recognized for plan purposes in each year they are plan participants. The second type of career-average formula averages the participant's yearly earnings over the period of plan participation. At retirement, the benefit equals a percentage of the career-average pay, multiplied by the participant's number of years of service.
- *Final-Pay Formulas* (also called final-average salary formulas)—These plans base benefits on average earnings during a specified number of years at the end of a participant's career; this is presumably the time when earnings are highest. The benefit equals a percentage of the participant's final average earnings, multiplied by the number of years of service.

Nonunionized private sector employees and employees in public sector jobs typically participated in career-average-salary or final-average-salary defined benefit (DB) plans.

While public sector pensions remain largely of the defined-benefit type, private sector pensions shifted strongly to defined contribution (DC) plans in the 1980s and 1990s. In DC plans, employers contribute specified amounts (often a percentage of salary) to an individual

account established for participating employees. The benefit available to the employee at retirement depends on the amount contributed by the employer, any contribution by the employee, and the investment income earned on these contributions over the years. Usually the employee manages the investments in his/her individual account. The employer does not guarantee the employee any specific level of income in retirement.[3]

In 1979, 62 percent of private sector workers who participated in an employer-based retirement plan had only a DB plan. Another 22 percent had a DB plan along with a DC plan. Only 16 percent had only a DC plan. By 2004, these numbers were reversed. Only 10 percent of private sector workers with employer-based pensions had just a DB plan. Twenty-seven percent had both DB and DC plans, while three-fifths (63 percent) had only a DC plan.[4]

In addition, private sector employers sponsoring DB plans had moved away from their exclusive reliance on the traditional formulas for determining retirement benefits. In 2005, a quarter of private sector workers who participated in DB pension plans were in redesigned plans, mostly so-called cash balance (CB) defined benefit plans. These plans, which will be described more fully in Section VII, resemble traditional DB plans in that employers make a guarantee to employees (in this case, they guarantee a certain investment return) and manage retirement assets for all participants. CB defined benefit plans, however also have features (such as "hypothetical" individual accounts) that resemble DC plans. Table 1 shows that the percentages of private sector workers in DB plans using a CB formula to determine benefits was highest among white collar workers and workers in service producing industries.

Finally, it is important to note that private sector workers generally have less access to employer-sponsored retirement plans than do public sector workers. Table 2 indicates that only 70 percent of full-time workers in the private sector had access to an employer-sponsored retirement plan in 2007. Only 24 percent had access to a DB plan, although almost all workers with access to such a plan participated in it. While 64 percent of full-time private sector workers had access to a DC plan, only 50 percent participated in such a plan. For full-time state and government workers, on the other hand, virtually all had access to a retirement plan and 91 percent had access to a DB plan.

TABLE 1--Defined benefit plans: Primary formula, all private industry workers, 2005

Characteristics	Traditional plans	Cash balance	Pension equity
All workers	75	23	2
Worker characteristics			
White collar	65	33	2
Blue collar	87	12	1
Service	86	14	1
Union	88	12	less than 0.5 percent
Nonunion	68	29	3
Establishment characteristics			
Goods producing	88	10	2
Service producing	68	30	2

Source: U.S. Department of Labor, U.S. Bureau of Labor Statistics, *National Compensation Survey: Employee Benefits in Private Industry in the United States, 2005*, Bulletin 2589, May 2007, Table 44.

Private sector and public sector plans are embedded in different contexts

The big shift in private sector pensions has caused some to assume that public pensions ought to mirror private practice. The private and public sectors, however, operate in two very different environments that must be taken into account in discussions of future public pension policies.

Most important is that a sizeable number of teachers do not participate in the retirement part of the Social Security program. One estimate[5] puts the proportion of teachers not covered by Social Security at nearly half.

TABLE 2--Retirement benefits: Access and participation, full-time private industry and state and local government workers, 2007

(All full-time workers in each sector= 100 percent)

Characteristics	All private industry workers	All state and local government workers
All retirement benefits		
Access	70%	99%
Participation	60%	95%
Defined benefits		
Access	24%	91%
Participation	23%	88%
Defined contributions		
Access	64%	33%
Participation	50%	21%

Sources: U.S. Department of Labor, Bureau of Labor Statistics, *National Compensation Survey: Employee Benefits in Private Industry in the United States, March 2007*, Summary 07-05, August 2007, Table 1; U.S. Department of Labor, Bureau of Labor Statistics, *Employee Benefits in State and Local Governments in the United States, September 2007*, Summary 08-02, March 2008, Table 1.

Workers who do participate in Social Security have a guaranteed, inflation-adjusted retirement income to undergird whatever other pension and retirement savings they have. They are also eligible for Social Security death and disability benefits. Private sector employers and employees are required to participate in Social Security; each pays 6.2 percent of taxable earnings annually into the Old-Age, Survivors, and Disability (OASDI) insurance program. Each also pays 1.45 percent of earnings into Medicare's Hospital Insurance program.

Most state and local government employees hired after 1986 participate in Medicare, but OASDI coverage for public workers depends on individual state decisions about participation. Public employees were originally excluded altogether from Social Security in the 1930s because of constitutional questions about whether the federal government could impose taxes on state and local governments. In the 1950s federal legislation allowed states voluntarily to participate in the program.[6]

Appendix Table A-1 indicates which state (and several school district) teacher retirement plans participate in Social Security and which do not. Nonparticipating states include Arkansas, California, Colorado, Connecticut, Illinois, Kentucky, Louisiana, Massachusetts, Maine, Missouri, Nevada, Ohio, and Texas.[*] In nonparticipating states, employees' state or local retirement plans must meet retirement needs that elsewhere are met jointly by Social Security and employer-sponsored pension plans. Teachers without Security Security coverage must also look to their employer-sponsored plan for disability and survivors' insurance if employees are to have access to such benefits. Thus, employer contributions to the teacher retirement plan tend to be higher in nonparticipating states (but of course these employers are not paying Social Security taxes for the OASDI program).

Another distinction between private and public retirement plans is whether employees as well as employers contribute to them. In the private sector, employees often are not required to contribute to their plans (but they do have to pay Social Security taxes). In the public sector, employee contributions are the norm. Appendix Table A-1 indicates that teacher contributions range from nothing (in Florida and Utah) to 12 percent of earnings (in Missouri). Many plans are found in the 5 to 9 percent range for required employee contributions.

In addition, private and public pensions operate within two distinct legal and regulatory frameworks. Private employers are not required to offer retirement plans, but to receive favorable federal tax treatment (for themselves and their employees) employers that do sponsor pensions must abide by the provisions of the federal Employee Retirement Income Security Act (ERISA) of 1974. ERISA rules (which supersede any related state rules) govern reporting,

[*] In nonparticipating states, some school districts have chosen to participate in Social Security, and they and their employees pay OASDI taxes. The Austin (TX) Independent School District is one such example. States have not necessarily made the same decision about Social Security participation for different groups of public employees. For example, whereas Connecticut and Illinois teachers do not participate in Social Security, state workers do.

disclosure, fiduciary responsibility, eligibility, vesting, and funding. ERISA also established the Pension Benefit Guaranty Corporation (PBGC) and requires private employers to pay insurance premiums to this agency.[7] The PBGC oversees the termination process when private employers decide to end a pension plan. Normally, the employer terminating the plan pays out accumulated benefits either by purchasing annuities for plan beneficiaries or by making lump-sum payments. If the employer is in financial distress (as determined by the agency or a bankruptcy court) the PBGC may take over the terminated plan and pay out benefits up to federally determined limits. These benefits may be less than the employee had accumulated in the terminated plan.[8]

ERISA is frequently cited as a major reason for the shift among private employers from DB to DC pension plans. ERISA increased the costs of operating DB plans in the private sector, through provisions such as requiring full funding of pension liabilities, imposing administrative costs for processes that insure compliance with ERISA rules, and mandating termination insurance payments to the PBGC.[9] In the private sector, therefore, many employers found it cost effective to switch from DB to DC plans. In the public sector, however, because ERISA generally does not apply, the Employee Benefit Research Institute says that the costs of administering a DB plan are "decidedly less" than the costs of administering a DC plan.[10]

State and local pension plans are exempt from most of the provisions of ERISA, although subnational governments must abide by certain Internal Revenue Code requirements to protect pension plan members from incurring tax liabilities on their pension contributions and on their accumulating pension benefits before retirement. More importantly, however, state and local plans are governed by numerous state rules that are imbedded in state constitutions, laws, and regulations. These are regarded as generally offering public employees even stronger protections than those enjoyed by private workers.

A key effect of the different legal frameworks governing public sector pensions is that pension benefits cannot easily be reduced for current public sector employees. "Given that public pensions are often legally defined as an accrued benefit earned over the life of an employee's service, cutting benefit levels that have accrued to employees is often legally restricted. Roughly 40 states have some form of nonimpairment clause that makes restructuring existing pension benefits essentially impossible. While pension benefits can be restructured for future employees, it is virtually impossible to reduce them for existing workers."[11]

Table 3 illustrates that every state has constitution clauses, statutes, or case law that restrict policy makers' ability to modify public pensions. In a state such as California where voter-initiated ballot propositions are permitted, citizens also have the option of directly determining public pension rules through the electoral process.[12]

Public sector employers generally cannot do as many private sector employers have done and terminate one kind of plan (e.g., DB) while moving current workers into a new kind of plan (e.g., DC). Likewise, states may not be able to change other aspects of a current worker's plan. So, for example, states may find that while they can impose higher required contribution levels or less-generous early retirement rules on employees hired after a certain date, they must allow employees hired before that date to continue under the old arrangements. This may result either in public pension plans with "tiers" of contribution requirements and/or benefits, depending on when employees were hired, or in the existence of separate plans for earlier and later hires.

Analysts note other differences between the private and public sectors that affect pension design. While the general public may not have a strong interest in whether a particular private firm can attract and retain needed personnel, citizens have a more direct concern for the ability of government agencies that provide vital public services such as police and fire protection and education to fill their positions with qualified workers.[13] Governments, as nonprofit entities, do not offer employees the same opportunities for extraordinary compensation through bonuses and profit sharing that private workers have. Thus, public employers tend to emphasize secure retirement income in their pension plans rather than wealth accumulation, which may be a higher priority in private plans.[14] Finally, public sector pension decisions are by definition political decisions. Whereas economic forces rather than political forces are the stronger influences on private pensions, the reverse in true in the public sector. Elected officials often make the key decisions about public plan structure and features. Furthermore, public employees are much more likely to be represented by labor unions than are private sector workers; and organized labor plays a prominent role in debates over government retirement benefits.[15]

TABLE 3—Legal restrictions on altering public employee pension benefits

States with specific constitutional prohibitions against the impairment of public employee pensions	
Arkansas	Michigan
Hawaii	New Hampshire
Illinois	New York

States with general constitutional prohibitions against the impairment of contracts (applicability to pensions depends on whether courts view pensions as contractual obligations; also states that do not have their own constitutional contract clause often rely on the contract clause of the U.S. Constitution)		
Arkansas	Nebraska	Rhode Island
Georgia	New Jersey	Tennessee
Indiana	Oklahoma	West Virginia

States with statutes or case law prohibiting impairment of public employee pensions		
Alabama	Louisiana	Ohio
Arizona	Maryland	Oregon
California	Massachusetts	Pennsylvania
Colorado	Maine	South Carolina
Connecticut	Minnesota	South Dakota
Delaware	Mississippi	Texas
District of Columbia	Missouri	Utah
Florida	Montana	Vermont
Idaho	Nebraska	Virginia
Iowa	Nevada	Washington
Kansas	North Carolina	Wisconsin
Kentucky	North Dakota	Wyoming

Source: James E. Spiotto, "If the Pension Bomb Stops Ticking, What Happens Next?" Forum on Public Pension Funding sponsored by the Civic Federation, the Federal Reserve Bank of Chicago, and the National Tax Association, 2006, accessed at http://www.chicagofed.org/news_and_conferences/conferences_and_events/files/2006_pension_spiotto.pdf on March 25, 2008.

III. TEACHERS' PRIMARY PENSION PLANS

In fiscal year (FY) 2005-06, state and local government employees received pension benefits through 221 state plans and 2,433 local ones (of which 11 were run by school districts). Pennsylvania had 925 retirement plans while Hawaii and Maine had only 1 each. With about 18.5 million members, state and local plans averaged just under 7,000 members each.[16]

Many of these plans, however, serve only state and local employees other than teachers. Teachers participate in only a very small number of public pension plans, mostly in larger programs operated at the state level. It is important that discussions of the characteristics and health of teacher pensions be based on the programs in which teachers actually enroll. Therefore, this paper draws on the Public Fund Survey, a continuously updated online compendium of data on 101 public retirement systems that operate 125 plans covering more than 85 percent of the state and local public retirement system community.[17] Further, we have identified 58 of those 125 plans in which teachers participate. These 58 plans are listed in the Appendix tables and are the focus of this paper. In the following discussion and where indicated, Public Fund Survey data have been augmented with data from the latest survey of educator pension plans conducted by the National Association of Education.[18] The only relevant difference in plan coverage between the Public Fund and NEA surveys so far as teachers are concerned is that the NEA survey includes three school district pension plans (Kansas City and St. Louis, MO, and Omaha, NE) that are not included in the Public Fund Survey and are not included in the Appendix tables for the sake of comparability. The NEA survey of 99 education plans includes about 40 plans that enroll non-teaching public school staff and/or higher education personnel, but not teachers.

Two clarifications are in order. First is the distinction between retirement "system" and retirement "plan" as these terms are used in the Public Fund Survey. Some systems (e.g., the Florida Retirement System) have just one plan within them; members from multiple types of public agencies are governed by the same rules concerning such things as contribution levels and benefits. In other cases (e.g., Colorado) one state system (the Colorado Public Employees Retirement System) has several plans within it: for example Colorado PERA includes the Colorado State Plan, the Colorado Municipal Plan, and the Colorado School Plan. Plans within a single system cover distinct groups of employees and are discrete entities with their own rules

and assets and liabilities. In yet another model, a state may have several completely separate public pension systems. Thus, in California teachers belong to the California State Teachers Retirement System, while many other state and local employees are members of the nation's largest pension system, the California Public Employees Retirement System. These distinctions are useful to keep in mind when people refer to public pension systems or plans, as generalized statements about a system, for example, may not apply to a specific plan within the system.

Second, school personnel other than teachers may be in different systems or plans. According to the NEA survey, 8 of our 58 plans include teachers only. The rest include various combinations of teachers and/or education support professionals and/or higher education faculty and/or higher education support professionals. It is not uncommon for public school education support professionals to be in different plans than public school teachers. Teachers in some states are in the same plan as other state and/or local workers.[19]

The basic design of teachers' primary pension plans

In FY 2006, no state or school district required teachers to participate in a DC pension plan as their primary retirement benefit. (Michigan made a DC plan the primary, exclusive pension for state employees in 1997, but did not include teachers in the conversion.) In FY 2006 most teachers participated in a traditional final-average-salary DB pension plan. Many had the option of making voluntary contributions (without any employer assistance) to a separate DC plan for supplemental savings. These supplemental plans are also tax advantaged under the Internal Revenue Code, but are not considered in this paper.

For teachers in traditional DB plans, their annual retirement benefits are determined by a formula that multiplies (1) their years of service by (2) some measure of their final salary (often a three-year final average) by (3) a so-called benefit factor or replacement rate ("R"). Thus:

Annual income in first year of retirement = service (years) X final annual salary X R.

For example, if a teacher retired with 30 years of service and a final average salary of $60,000 and his/her pension plan used an "R" of 2 percent, her annual income in his/her first year of retirement would be $36,000.

Appendix Table A-2 shows the years of service and age requirements for normal retirement in teacher pension plans and also the "R" benefit factors used.*

Several states have adopted "hybrid" plans as their primary plans for teachers. In Indiana, Oregon, and Washington State, some teachers (e.g., new hires after a specified date) participate in plans that have both a traditional final-average-salary DB and a DC component. Members of Washington's Teachers Plan 3, for example, are teachers who joined the plan after July 1, 1996 or who chose to transfer from an older plan. Employer contributions on teachers' behalf are made to the DB plan. Employees' own contributions are invested in individual DC plan accounts.[20] The "R" in the DB benefit formulas in these hybrid plans is lower than the "R" found in typical teacher DB programs, because part of a teacher's retirement income is expected to come from his/her individual DC account.

In Florida, Ohio, and South Carolina, teachers have the option of choosing a DC plan as their primary plan rather than participating in the DB plan.[21] This option is thought to be especially attractive to teachers who do not expect to spend a full career in teaching or in the same state or district, for reasons that will be discussed more extensively in Section V.

Alaska and West Virginia represent two special cases.

As of July 1, 2006 all new members of the Alaska Teachers Retirement System (as well as other public employee newly enrolling in their own retirement system) will participate in a DC retirement plan. The previous DB plan is henceforth closed to teachers. As noted in Table 3, Alaska is one of the states with a strong constitutional prohibition against pension reductions for current employees. Article XII, Section 7 states that: "Membership in employee retirement systems of the State or its political subdivisions shall constitute a contractual relationship. Accrued benefits of these systems shall not be diminished or impaired." [22] Several other states have considered switching from DB to DC plans in recent years (Governor Schwarzenegger's 2005 proposed switch for California's teachers and other public employees being the most widely publicized example),[23] but to date only Alaska has made the move.

West Virginia appears on the verge of resolving a long-running dispute that has complicated a 2005 decision to end a DC plan that had been the primary plan for teachers since

* Here and elsewhere in the paper (unless otherwise noted) when specific characteristics of pension plans are described, they refer to the rules in effect for current entrants into the plans. As previously noted, for legal reasons pension plan changes usually cannot be applied to employees already on the job.

the state froze a badly underfunded DB plan in 1991. Employees hired since 2005 enroll in the newly reopened DB plan. In 2006 teachers in the DC plan voted to switch into the DB plan, but some DC plan participants objected to the forced conversion and sued to stop it. The state legislature recently agreed to put the issue to another vote of teachers. If at least 65 percent of the teachers in the retirement system approve, participants in the DC program will be able to move to the DB plan or stay with the DC plan. If fewer than 65 percent vote for the new arrangement, the DC plan will remain the primary plan for those who entered it while the DB plan was closed.[24] Results of the election are expected to be available in June 2008.

Some distinctive features of teachers' DB plans

Teachers' DB plans have several features that are common in public sector pensions but that are increasingly rare in the private sector.

Cost of living adjustments. Unlike private sector pensions, public sector pensions typically include cost of living adjustments (COLAs) that apply once retirees begin drawing on their annuities. Some are automatic and fixed (e.g., 3 percent annually, compounded). Some are automatic and tied to the Consumer Price Index. In some states, the adjustments are ad hoc decisions made by the retirement fund governing board or the legislature. In a few plans COLAs are linked in part to the market returns on invested retirement assets. COLA provisions for all the teacher plans are shown in Appendix Table A-2.

Young ages for normal retirement. As Appendix Table A-2 indicates, with just a few exceptions teacher retirement plans permit teachers to take "normal" retirement and receive their full pensions earlier than Social Security and many private sector programs. May teacher plans permit normal retirement for long-serving individuals in their 50's. Some states use formulas like the "rule of 80" or "rule of 85": that is, teachers can retire with full benefits when the combination of their age and years of service equals the specified number.

Early retirement benefits. Appendix Table A-2 also shows that teachers can generally retire earlier than the normal retirement date and receive pension benefits. Usually these benefits are reduced by some formula. According to the National Education Association, "[e]arly retirement

benefits are usually computed based on the normal retirement formula, and the benefit is then reduced by either a specified annual percentage or by an actuarial reduction applied according to the number of years that the early age retirement precedes the normal age retirement."[25]

IV. THE FUNDING AND SUSTAINABILITY OF EXISTING PENSION PLANS

Are teacher pensions in financial trouble? Reports entitled "the gathering pension storm" facing government pensions[26] and "the public pension crisis"[27] suggest that they are. "[A] bill coming due [for state retiree pensions and other benefits] over the next few decades that can be conservatively estimated at $2.73 trillion" certainly might be cause for alarm.[28] Current unfunded public pension liabilities of more than $350 billion cause some to argue that we have "a national, systemic problem."[29]

As observed earlier, however, there are thousands of public pension funds; and teachers belong to a relatively small number of them. Even if their own funds are not in difficulty, problems elsewhere in the public sector could have an impact on them, as will be discussed later. More threatening in a national sense, however, are not the future liabilities in public pension plans (a substantial part of which are prefunded), but the enormous and almost totally unfunded obligations that state and local governments face for future retirees' health care costs.

Conclusions about whether changes are warranted in teacher pension plans depend on how well structured these particular plans are to meet their current and future commitments, in light of their own unfunded liabilities and the stresses that governments may be facing from other sources.

The current funding status of teacher pension plans

Disquieting headlines or report titles aside, recent studies by credible, objective organizations have not found a broad crisis in the public pension arena. The Pew Center on the States, author of the $2.73 trillion estimate just cited, concluded that "[f]rom a national perspective, states' pension plans seem to be in reasonable shape."[30] Retiree health benefits were seen as much more problematic. Likewise, the Government Accountability Office (GAO) said in late 2007 that state and local governments appeared able to fully fund their pension

obligations on an ongoing basis with only a small increase (0.3 percent of salaries) above their current contributions.[31]

When a plan's assets match its liabilities, the plan is said to be fully funded. If the ratio of assets to liabilities is less than 100 percent, the plan is described as underfunded. Some plans may also be overfunded, with (from an actuarial perspective) assets than are greater than those needed to meet the present value of current liabilities. The Florida Retirement System, for example, reports a funding ratio of 105.6 and has been fully funded since 1998. This accomplishment appears due at least in part to "legislation that basically reserved a portion of the pension surplus to serve as a safeguard against unexpected increases in liabilities, providing the state with extra financial security."[32]

According to the Public Fund Survey, the latest available data on all 125 plans in its report indicate that public pension systems have $2.363 trillion in actuarial assets and $2.734 trillion in actuarial liabilities, giving an aggregated actuarial funding ratio for all the plans of 86.4 percent. This is very close to the aggregated actuarial funding ratio of 85.7 percent for the 58 teacher pension plans and to the funding ratio the Pew Center for the States found in its independent survey of public sector pensions which included a wider range of public employees and plans.

As Appendix Table A-2 shows, however, funding ratios in teacher pension plans vary widely, with West Virginia's just re-opened plan having a funding ratio of only 31.9 percent and several plans being nearly fully funded or even over funded in actuarial terms. Table 4 summarizes the ratios found across the plans.

Actuarial funding ratios are useful indicators, but they must be interpreted with caution. They are statements at a particular time about how the assets in a pension plan compare to the present value of the benefits that plan members have accrued. Ratios do not indicate anything about whether a plan is moving in a healthy or unhealthy direction. If a plan is amortizing previous unfunded liabilities, for example, it may appear at a given point to have a large unfunded liability; but in fact its funding ratio might be on target with a planned schedule for achieving financial soundness. Since unfunded liabilities are typically amortized over 30 years, the key question for an underfunded plan is whether it is making progress in reducing its unfunded liabilities.

TABLE 4—Actuarial funding ratios for teacher pension plans

Funding	Number of plans
Plan funded at 100% or more	8
Plan funded at 90% – 99%	9
Plan funded at 80% to 89%	15
Plan funded at 70% to 79%	10
Plan funded at 60% - 69%	12
Plan funded below 60%	4

Source: The Public Fund Survey, http://www.publicfundsurvey.org (accessed March 27, 2008). Most but not all data are for FY 2006.

Moreover, funding ratios are not strictly comparable from plan to plan. How a specific ratio is calculated depends on a variety of rules used by actuaries to determine such things as the cost method, future investment returns, and the asset valuation method. Appendix Table A-3 illustrates the variation in a few of the basic assumptions employed in calculating teacher pension plan liabilities. Calculations about a plan's financial strength can be quite sensitive to the assumptions made about the future rate of return on invested pension funds, and this becomes increasingly true as a plan matures.[*] GAO, for example, determined that public pension plans at current contribution levels (9.0 percent of salaries) would need to be raised only to 9.3 percent of salaries for employers to be able to meet their future obligations, if investment returns followed past patterns. If the future real rate of return is 1 percentage point higher or 2 percentage point lower than the historic rate, however, annual contribution levels would have to be 5.0 percent of salaries or 13.9 percent of salaries, respectively.[33]

[*] The assets available to pay promised pension benefits to retirees consist of contributions from employers and employees (which are relatively predictable) plus investment returns on these assets minus plan expenses. As a pension plan matures, the proportion of its annual income that comes from investment returns becomes larger relative to the annual contributions made on behalf of plan members. Thus assumptions about investment returns have an increasing impact on calculations about the plan's ability to meet its obligations.

Finally, questions are growing within the pension community about whether a wholly new approach, based on concepts from the field of financial economics, is needed to measure accurately the funded status of public pension plans. While a fuller discussion is beyond the scope of this paper, it is worth taking note of the controversy and pointing out that "mark to market" rather than standard actuarial methods for valuing assets and liabilities appear likely to indicate that current liabilities are understated and that higher current contribution rates are called for.

With these caveats in mind, though, reported funding ratios can be used to begin examining whether pension plans will be able to fulfill their promises about retirement benefits. The opinions cited above that many public pensions are adequately funded are based on the fact that many plans (including many of the larger ones) report funding ratios of at least 80 percent. As GAO noted, "A funded ratio of 80 percent or more is within the range that many public sector experts, union officials, and advocates view as a healthy pension system."[34] Full funding is not considered as important for public pensions as it for private pensions (where full funding is required by ERISA) because governments have taxing authority and can only in extreme cases declare bankruptcy. Nevertheless, the point-in-time snapshot for our 58 teacher plans indicates that 26 fall below the 80 percent threshold. The data, it should be noted, were reported before the financial market turmoil that began in late 2007.

The author of the Public Fund Survey suggests that:

> Underfunding is a matter of degree, not of kind. That is, underfunding is not necessarily a sign of fiscal or actuarial distress; many pension plans remain underfunded for decades with no detrimental consequences….
>
> *The critical factor in assessing the current and future health of a pension plan is not so much the plan's actuarial funding level, as whether or not funding the plan's liabilities creates fiscal stress for the pension plan sponsor* [emphasis in original].[35]

This idea of viewing the health of a teacher pension plan through the lens of the stress it currently or potentially poses for the plan sponsor seems like a very constructive starting point for evaluating individual plans. It reflects the fact that sustainability will depend on a number of factors outside of the pension plan itself, many of which will be specific to an individual sponsor (such as what is happening to the tax base in a particular jurisdiction and how population changes may be affecting the demand for public services of various kinds).

In addition, however, there are some general pressures that could pose challenges to financial sustainability for many plans.

Threats to financial sustainability

Public pension plans generally and teacher plans specifically are vulnerable to some common threats that often receive insufficient attention from public officials responsible for pension policies.

Employers' failure to make actuarial required contributions. To maintain or reach full funding in a pension program, the sponsor must annually make its actuarial required contribution (ARC). This consists of "the amount of funding needed to pay for new liabilities accrued in that year ["normal cost"] as well as to pay off a portion of the unfunded liabilities accrued in previous years."[36] State and local governments frequently fail to make these contributions in full. The Pew Center recently estimated that among the states there was about a 50-50 split between those making their funding requirements and those failing to do so.[37] Not only do pension plans with unfunded liabilities fall even further behind in years when they do not pay ARCs, but these missed payments can create a financial drag on the pension plan for many years to come.

Illinois, for example, is reported to have the largest unfunded pension obligation in the nation for its five state employment plans, one of which covers teachers. The Center for Tax and Budget Accountability reports that the practice of failing to meet even the normal cost for the pension plans dates back over 35 years. Despite some efforts to reduce liabilities, the state took so-called pension holidays in FY 2006 and 2007 to avoid fully meeting its pension obligations.[38] Such holidays are not uncommon, especially when states or cities are under fiscal pressure from other spending demands and tax revenues fail to keep up. In Illinois, the compounding problem of repeated failures to fully fund pensions puts the state in ever-deeper financial peril, since it is one of the states with a constitutional prohibition against diminishing or impairing pension benefits under an enforceable contractual relationship between pension plan participants and the government.

The Wisconsin Retirement System has some unusual protections against underfunding. The consulting actuary, with approval of a board of trustees, sets contribution levels. In other states, legislatures often have this responsibility. If local governments do not pay their share, the

state will deduct what they owe from state aid programs. Moreover, retirees receive COLAs only when investment returns are sufficient to pay them, and COLAs can be taken back if investment returns are negative.[39]

Unfunded "benefit bumps." As previously noted, public pension plan policies are made in a highly politicized environment. One result is a penchant among lawmakers to increase pension benefits, especially when economic times are good and investment returns are outpacing immediate needs. Too often, however, these decisions are made without sufficient attention to their effect on the pension plan "bottom line" over the long term.

For example, the Pioneer Institute for Public Policy Research reports[40] that in 2000 the Massachusetts legislature passed "a massive enhancement of benefits for teachers." The contribution rate for new teachers was increased and benefits were raised for long-time teachers. At retirement, the pensions of teachers with 30 or more years of service would be increased by 2 percent per year for each year of service in excess of 24. Teachers already in the system could opt into the new arrangements by paying the higher contribution rate. The buy-in rules for teachers nearing retirement were generous. The Pioneer Institute shows how a 30-year veteran with 30 years of service could increase his/her expected lifetime annuity payments by $165,000 for a buy-in cost of $18,000.

This is only one of many "benefit bumps" in public pension programs around the country.

Some states have taken action designed to force costs as well as benefits to be considered when pension benefit increases are being debated. Georgia's state constitution requires that public retirement plans remain actuarially sound. To accomplish this, the state requires that pension legislation with a fiscal effect can be introduced only in the first year of the General Assembly's two year term and can be passed only in the second year (and these actions have to take place in regular, not special, sessions). Such legislation cannot be considered by the full House or Senate unless its actuarial cost has been determined. Retirement bills become null and void if their first-year funding costs are not appropriated in the year of enactment. Finally, the state is required to contribute its ARC (i.e., both normal cost and the amount necessary to amortize any unfunded liability).[41] Oklahoma has similar requirements. Missouri does not allow public pension plans to increase benefits if the plan is less than 80 percent funded.

"Gaming" the system to increase pension benefits. DB pension benefits that are based on final average salaries are vulnerable to "gaming" in order to increase pension benefits. Some examples involving teachers have to do with teachers in non-Social Security states exploiting loopholes in order to qualify for spousal Social Security benefits for which they would otherwise be ineligible. It is unclear how much "spiking" (inflating end-of-career salaries) goes on in teaching, but the phenomenon is generally acknowledged as a concern in public pension systems. One way individuals can "spike" is to move into higher paying jobs in the years that count for pension determination. In North Carolina, for example, researchers heard about teachers who move from low-paying to high-paying counties for the last few years of their careers to qualify for higher benefits under the state retirement system.[42]

Some states have enacted laws to circumvent spiking in public pension systems. Missouri, for example, limits (with some exceptions) the maximum annual percentage increase that will be counted for pension purposes in the final salary period to 10 percent. Illinois also caps end-of-career salary increases.

Stresses from non-pension unfunded commitments. How burdensome pension liabilities will be for states and local governments depends on other unfunded commitments. The "600 pound gorilla" here is retiree health care. As the recent Pew Center for the States report[43] demonstrates, unfunded liabilities for retiree health care costs are finally being tallied up thanks to new reporting requirements from the Government Accounting Standards Board. Most governments are just realizing for the first time how large these liabilities are. While governments can change health care commitments much more easily than pension commitments, the political costs of reducing expected benefits will be high. The financial stresses imposed by these non-pension obligations seem certain to cast a shadow over discussions of pension policy as well.

V. WHO BENEFITS AND WHO LOSES UNDER CURRENT PENSION DESIGN?

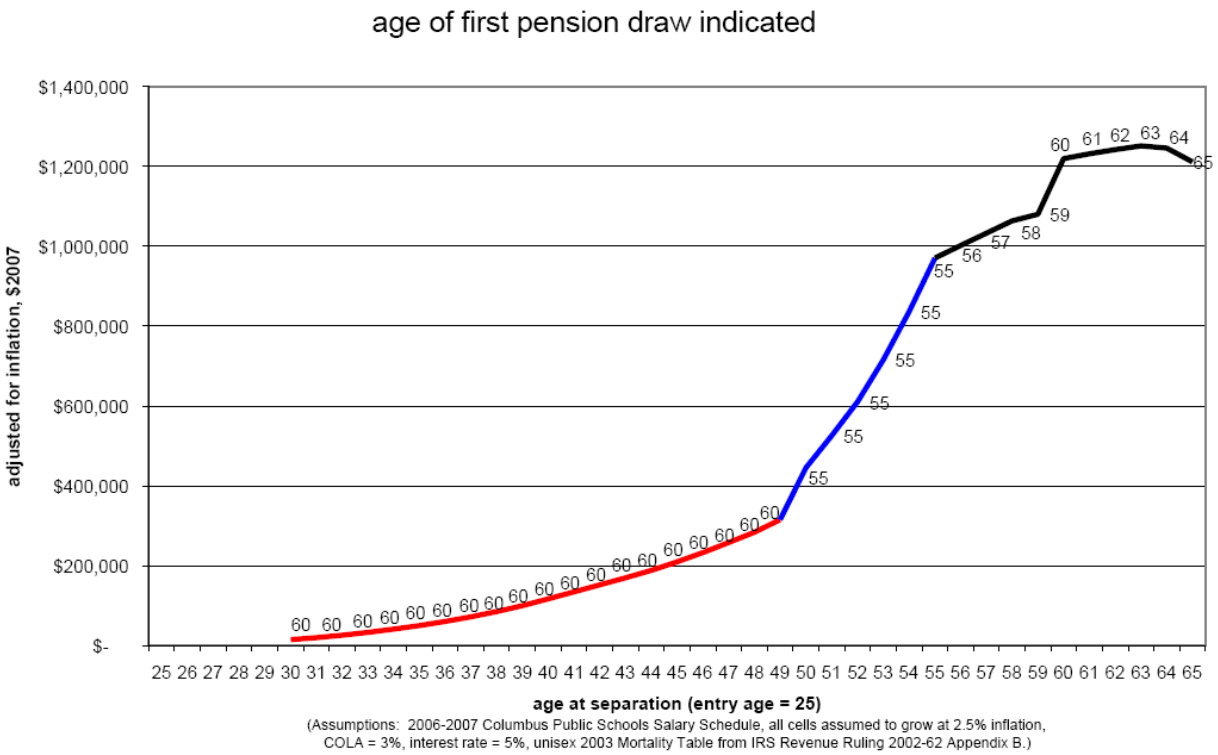
Distinct from the question of whether teacher pension plans are financially sustainable is the question about how fairly they treat all the teachers they serve and what if any effect they have

on schools' ability to find qualified staff. The almost universal adherence of public pension plans to the final-average-salary DB design is frequently justified on the grounds that it is desirable to have a long-term, stable public workforce to serve community needs and that it is important to ensure loyal career employees that they will have a secure source of income once they retire. The back-loaded benefits embedded in the traditional final-average-salary DB formula are designed to meet these objectives for long-serving teachers. What is increasingly unclear, however, is how well the traditional design serves the teaching force as a whole, especially those teachers who do not teach for 25 or 30 years or who do not remain in the same location throughout their careers. In a 21st century world where employee mobility is increasingly a feature of modern economic life (and where many young adults expect to hold multiple jobs during their lifetimes), the question of how well the current pension system serves all teachers merits re-examination.

Back-loaded benefits: how pension wealth accumulates over a teacher's career

Participants in traditional final-average-salary defined benefit pension plans do not accrue benefits evenly over their careers. One way to show this is to measure the growth in a teacher's pension wealth over his/her career, as Costrell and Podgursky have done in Figure 1 for an illustrative teacher in the Ohio retirement system. Pension wealth is a measure of the present value of a stream of pension payments or the market value of an equivalent annuity. In the example of the Ohio teacher, pension wealth accumulates very slowly for 20 or so years and then rises rapidly. Although the exact shape of the wealth curve reflects specific features of the Ohio plan, the overall shape is characteristic of traditional DB plans. One crucial feature to note is that pension wealth can actually begin to decline in a traditional DB plan if the teacher stays on the job long enough. This occurs because at some point the additional pension wealth accumulated for an additional year of teaching is not sufficient to offset the loss of income the teacher experiences by shortening by one year the time s/he can be expected to receive pension income in retirement.

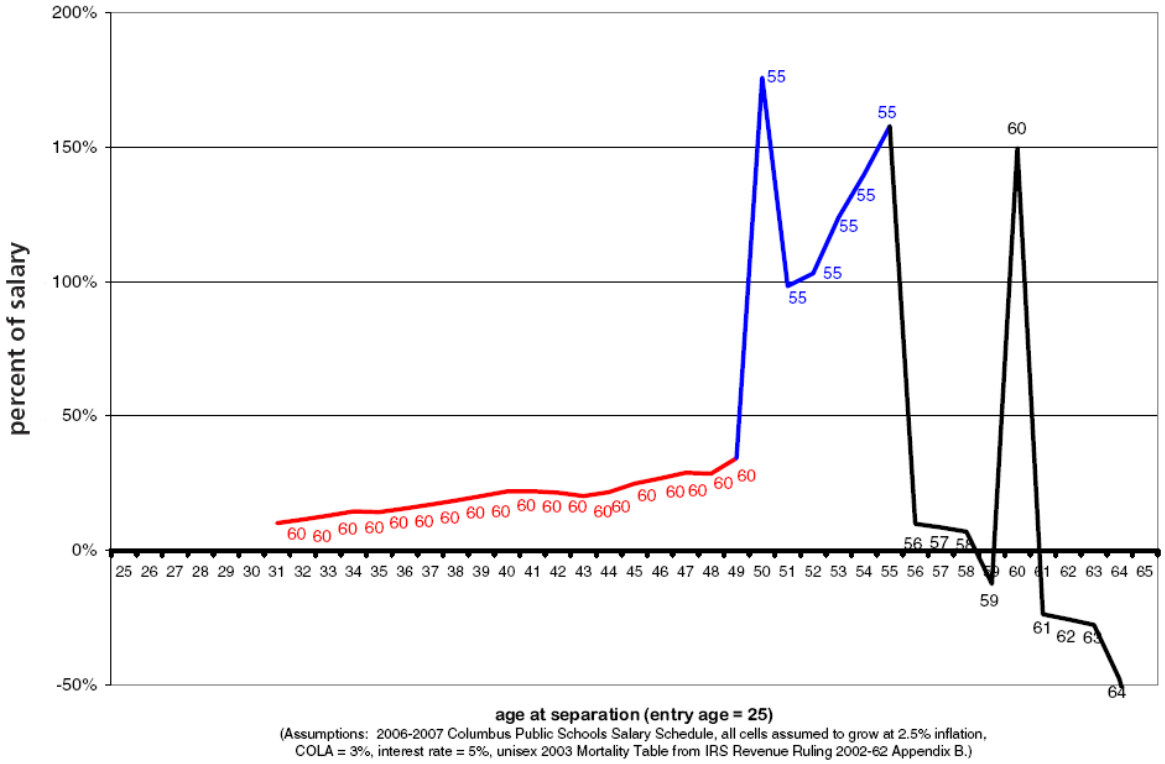
FIGURE 1—Pension wealth in dollars



Source: Robert Costrell and Michael Podgursky, *Golden Peaks and Perilous Cliffs: Rethinking Ohio's Teacher Pension System*, Washington, DC: Thomas B. Fordham Institute, June 2007.

Even though in this example pension wealth rises throughout most of a long career, the annual increase in pension wealth net of the earnings on the previous year's wealth ("deferred compensation") changes in idiosyncratic ways compared to annual salary ("current compensation") late in a teacher's career. Costrell and Podgursky also show this phenomenon for the illustrative Ohio teacher in Figure 2. The "peaks and cliffs" portrayed in this figure occur because of the way early and normal retirement provisions operate. Again, this particular pattern is illustrative of Ohio's pensions, but similar peaks and cliffs are found in other state plans.

FIGURE 2—annual deferred income, as percentage of earnings (age of first pension draw indicated)



Source: Robert Costrell and Michael Podgursky, *Golden Peaks and Perilous Cliffs: Rethinking Ohio's Teacher Pension System*, Washington, DC: Thomas B. Fordham Institute, June 2007.

How "short termers" fare under traditional DB pension plans

In general, and despite their idiosyncrasies, the structure of the traditional DB plans treats teachers well if they work a full career in teaching. For those who do not, however, the benefits are much less generous. These individuals are less well served than they would be under a pension framework (such as a DC plan) that accumulated benefits more evenly throughout a teaching career.

A teacher who leaves his or her job short of a full career generally can (and sometimes must) remain in a DB plan as an "inactive" member and receive a pension later at retirement age. The pension formula used to calculate the retirement benefit, however, will reflect the final

average salary at the time the teacher left the system. Since this could have been many years earlier, inflation will have taken a severe toll on the benefit level.

Some plans allow a departing teacher to cash-out the retirement benefit in some way. Seldom, however, will this teacher receive full credit for his or her own contributions, the employer contribution, and a market rate of return on these investments. Generally, a teacher withdrawing from a pension plan will lose all of the employer contributions made on his or her behalf. A few states have modified their plans to be more generous to departing employees. In South Dakota, for example, teachers leaving after three years of credited service but before retirement can select a "portable retirement option" which allows them to take with them their accumulated contributions (both employee and employer shares) and credited interest. The Colorado Public Employees Retirement Association allows a departing teacher (before retirement or age 65) to receive his or her own accumulated contributions (including interest at a 5 percent rate) plus a 50 percent "match" that gives the employee at least partial credit for the employer's contribution.

The typical teacher pension plan can exact a toll on individuals who are geographically mobile. Since there is virtually no cross-state reciprocity in teacher pensions (and sometimes limited reciprocity between local and state systems within the same state), a teacher could work for a full career in a succession of jobs in different states and never receive anything near the pension benefits he or she would have earned by staying in the same place. Long vesting periods (in some states as long as ten years) can further penalize a mobile teacher who may leave before becoming vested.

"Purchase of service credit" provisions exist in virtually all teacher pension plans and in theory compensate for some of these disadvantages. The provisions are cumbersome and limited, however, and differ from plan to plan. A mobile teacher who cashes out of one plan without receiving full credit for all employer and employee contributions and interest may not have enough money to pay the price of purchasing credit in the new system. An individual who enters teaching in mid-career and whose prior service was not in teaching or public employment may not be allowed to purchase credits. This person may be doubly disadvantaged, because he or she may not be given much if any credit on the "salary scale" for work in another field, so the final pension benefit will reflect both a limited number of years of service and a lower salary

than a long-term teacher of the same age would have. For all new entrants to a pension plan, the number of years of prior service credits than can be purchased is likely to be restricted.

Fairly limited attention has been paid to pension penalties incurred by "short termers" because teachers have generally been perceived as spending their careers "close to home." There is little empirical evidence available to date on the proportion of teachers who may suffer financial penalties from moving across state lines or from having shorter working lives because they "stop out" for a while for family or other personal reasons. A cursory look at financial reports from several state pension plans suggests, however, that a significant minority of their current retirees left the workforce with fewer than the 20 to 25 years of service that would qualify them for the good benefits that a back-loaded DB system provides a long-serving individual. There is also no way to measure the extent to which teachers are locked into their current jobs because of the financial price they would pay if they left their current pension plan. Superintendents, who often have careers spanning several states, have long been aware of the pension cost that mobility imposes.

How pension plan design can contribute to teacher shortages

The back-loaded and "spiky" pension benefits described above may not only be inequitable for individual teachers but can make schools "losers" under current pension plans as well because these plans may contribute to teacher shortages. The penalties paid by "short-term" teachers discourage individuals from moving from areas where their skills may be in surplus to areas which may be suffering from difficulties in filling their teaching slots. As we have just seen, these penalties can also serve as a disincentive to individuals who might want to spend a significant time as teachers but who do not see teaching as their single lifetime career.

Provisions for early retirement and pension provisions that (perhaps unintentionally) create financial incentives for teachers to retire at specific times in their careers may also induce these individuals to leave their jobs even though the resulting vacancy may be difficult to fill. The 2000 Massachusetts pension changes mentioned earlier were associated with about an 80 percent increase in the number of retirements in the first year that teachers could receive the new, higher benefits. The increase in retirement levels above those experienced before the 2000 reforms has continued in subsequent years.[44]

VI. RETHINKING TEACHER PENSION PLAN DESIGN

The debate over whether public pensions need to be redesigned has frequently taken the form of an argument over whether defined benefit pensions should be replaced, as they largely have been in the private sector, by defined contribution plans. Moreover, the argument is, as the authors of a TIAA Institute report note, often characterized by "heated rhetoric—but little light." They observe that:

> Public policy makers are often bombarded with emotion-laden arguments as to the relative merits of defined benefit (DB) and defined contribution (DC) plan designs. The "DB vs. DC debate often includes strong and heated rhetoric from both sides….
>
> Those who favor defined benefit plans have sometimes characterized defined contribution alternatives as "risky 401(k) plans" while those who favor defined contribution plans have, in turn, sometimes characterized DB plans as akin to welfare for public employees.[45]

Framing the debate as "DB vs. DC" obscures some important points. First is that each type of plan has advantages and disadvantages for employers and employees. Second is that the two types of plans are not as distinctive as they may at first appear. Many features that might justify a switch to a DC plan can also be built into a DB plan, and some DB-type features can also be added to DC plans. Finally, arguing in terms of the classic designs of traditional DB and DC plans fails to bring into the discussion new types of plans, such as the cash balance (CB) defined benefit plan. CB defined benefit plans can be designed with features that might address key interests of partisans on both sides of the DB/DC divide. The CB defined benefit alternative, which has been adopted by a number of private sector employers, has been used infrequently in the public sector. It is thus relatively unfamiliar to participants in public sector pension debates. Therefore, the final section of the paper will explain how this kind of plan works and why policy makers might want to consider it among the various options for pension plan redesign.

"DB vs. DC": the familiar arguments for and against

Table 5 lays out some of the key features of traditional DB and DC plans. Many of the familiar arguments for and against DB or DC pensions are rooted in the differences described in the table. Which features are seen as advantageous or disadvantageous depend on where one sits. Employers, for example, may welcome the fact that traditional DB plans provide their

Table 5: Characteristics of Defined Benefit and Defined Contribution Pension Plans

Characteristic	Defined Benefit	Defined Contribution
Determined in advance	Pension benefit	Pension contribution
Contributions are tax deferred	Yes	Yes
Encourages longer tenure	Yes	No
Portability	Limited	Full
Cost of living adjustments (COLAs)	Common	Uncommon
Typical vesting period	5 years	0 - 2 years
Timing of pension wealth accruals	Mostly late in career	Smooth accrual
Effect of salary changes	Affect past and future benefits	Affect future contributions
Control over investments	Plan sponsor	Employee
Form of pension benefit	Annuity	Lump sum

Source: Partially based on Leora Friedberg and Michael T. Owyang, "Not Your Father's Pension Plan: The Rise of 401(k) and other Defined Contribution Plans," *Federal Reserve Bank of St. Louis Review* 84, no. 1 (January/February 2002): Table 1; National Conference of State Legislatures, "Defined Benefit and Defined Contribution Retirement Plans," available at <http://204.131.235.67/programs/fiscal/defineretire.htm> accessed on March 31, 2008.

employees with benefits that cannot be outlived. Employers and employees may appreciate the fact that on average DB fund managers are likely to be able to achieve higher investment returns at lower costs than individuals can obtain on their own in managing DC accounts. Employers and taxpayers may question, however, whether benefits such as early retirement and inflation-protected pensions can be provided at contribution levels they are willing to support. Many employees may like the guaranteed lifetime income of a DB plan, but some may wish for more direct control over their investments or prefer more freedom to take lump-sum payouts rather than the traditional DB annuity. As we have already seen, long-term employees are likelier than their shorter-term colleagues to prefer DB over DC plans. Public citizens, who pay for the employer share of pension contributions, will have different views on such issues as whether it is appropriate for public sector workers to have more generous pension benefits than many taxpayers now enjoy.

While Table 5 is a common way of contrasting traditional DB and DC plans, a different and useful perspective is provided by Crane et al. in their TIAA Institute study. They compare the plans specifically through the lens of who bears the risks in each type of plan. As Crane et al.[46] describe them, risks include:

> Investment and Funding Rate Risk
>
> > Investment risk—the risk that investment returns will be less than necessary to provide the desired benefit levels.
> >
> > Funding rate risk—the risk that plan investment or benefits experience is worse than expected requiring higher contributions to properly pay for the promised or desired benefits.
>
> Longevity and Inflation Risk
>
> > Longevity risk—the risk that the participant will live longer than expected.
> >
> > Inflation risk—the risk that inflation will decrease the value of the earned benefit.
>
> Mortality and Disability Risk
>
> > Mortality risk—the risk that the participant will die before expected.
> >
> > Disability risk—the risk that the participant will become disabled before becoming eligible for regular retirement benefits.
>
> Termination Risk—the risk that the participant will end employment before vesting and forfeit accrued benefits.

Table 6: Retirement Plan Risk Allocation

Risk Area	Who Bears the Risk	
	DB	DC
Investment	Plan Sponsor	Participant
Funding Rate	Plan Sponsor	Participant
Mortality	Plan Sponsor	Participant
Longevity	Plan Sponsor	Participant
Inflation	Participant*	Participant
Termination	Participant*	Participant
Annuitization	Plan Sponsor	Participant
Disability	Plan Sponsor	Participant

** Many public defined benefit plans provide some level of inflation protection benefit for retirees, but rarely do so for participants who leave covered employment with deferred vested benefits to be paid in the future.*

Source: Roderick B. Crane, Michael Heller, and Paul Yakoboski, *Designing Public-Sector Pensions for the 21st Century: A Risk Management Approach*, TIAA-CREF Institute (Date Unknown), available at <http://www.tiaa-crefinstitute.org/research/articles/docs/DesigningPublicSectorPensions.pdf> accessed on March 31, 2008: Table 1.

Table 6 shows how these risks are divided among plan sponsors and participants intraditional DB and DC plans. This way of comparing plan types brings to the forefront the fact that plan sponsors bear most of the risks in DB plans, whereas plan participants bear most of the risks in DC plans. The uneven division of risk underlies a lot of specific objections to the two traditional types of public pension plans. It also helps explain the opposition of affected parties when proposed pension changes threaten to shift to them risks that they previously did not have to bear.

Why DB/DC distinctions are not as clearcut as generally perceived

It is customary for discussions of DB and DC pensions to draw a bright line between the two plan designs, as the last section does in describing characteristics of the traditional form of each pension type. But discussions of possible pension reforms also should consider that both types of plans can be modified to include features that embrace desirable elements of the other.

A few examples[47] indicate how this could be accomplished, depending on what specific concerns are being addressed. We have already seen how some states have modified their DB plans to work in tandem with a DC plan so that employees can enjoy the benefits of both and employers and employees can more evenly share pension risks. One of those states, Washington, has also tackled the concern that DC plan investors may suffer from lower investment returns because they do not have the bargaining clout of a big pension fund and do not have the same investment options (such as real estate, private equity, and hedge funds) that institutional investors do. Investors in Washington's Plan 3 DC account can choose to invest their funds in a total allocation portfolio (TAP) that is continuously managed and rebalanced by the Washington State Investment Board. TAP mirrors the investments in the state's DB plan.

DC plans can also be structured to include death and disability benefits of a kind traditionally found only in DB plans. In Florida, employers pay a separate surcharge that enables the state to give DC plan participants who become disabled the option of surrendering their DC account balances and receiving the same disability benefits as offered in the DB plan. Alaska has built benefits for occupational death and disability into its new primary DC plan.

Traditional final-average-salary DB plans can also be redesigned to have some DC-type features. The Wisconsin Retirement System allows DB plan participants to put 50 percent of their and their employer's contributions into a Variable Trust Fund, giving them some control over investments but subjecting them to some investment risk. In some DB plans, beneficiaries are now offered the opportunity at retirement to take a lump-sum distributions rather than being required to take a life-time annuity. Teachers in Colorado's state pension plan, for example, are credited with a fixed interest rate (currently 5 percent compounded annually) on their own contributions. If an individual chooses to withdraw his/her account after retirement eligibility or age 65 rather than take an annuity, s/he receives the amount credited to his/her account along with a 100 percent match (effectively accounting for the employer's contribution as well).

The California Legislative Analyst's Office (LAO) assessed Governor Schwarzenegger's proposal to shift the state's public employees from a DB to a DC plan and made a number of suggestions for ways in which concerns raised by the governor could be addressed within the structure of the DB program.[48] For example, the LAO indicated that concerns about benefits could be addressed by such steps as closing some formulas to new entrants, moving from a final year salary to a final-average salary with a three-year instead of a one-year base for calculating

pensions, and restricting retroactive benefit enhancements. Funding concerns could be addressed by setting aside funds in years when investment returns are better than expected to cover years when returns were below expectations, making employee contributions variable (as employer contributions are), and reasserting statutory rights to change employee contributions. The LAO also raised the possibility that the state might want to consider making its primary pension plan a cash balance defined benefit plan instead of the existing final-year salary DB plan.

Cash balance plans: the road seldom taken (in the public sector)

Cash balance plans are interesting because they are legally treated as defined benefit programs. They have certain characteristics in common with DB programs (including guarantees about retirement income benefits); but they also have characteristics of DC programs. Generally described as a "hybrid" pension design, CB plans share many of the risks in pension plans between employers and employees. DB and DC plans, by contrast, place various kinds of risks exclusively on one or the other party.

As indicated earlier, private employers who continue to sponsor defined benefit pensions have moved nearly a quarter of their workers into cash balance plans. In the public sector, however, we could find only two such plans. California has a cash balance plan, administered by the California State Teachers Retirement system, for part-time teachers. Nebraska has implemented a CB plan for its state and local employees, though not for teachers. Nebraska's state and local employees were in a DC plan from 1964 to 2003. Investment returns in the DC lagged those in the state's other DB programs over that period. About half of the DC participants were in the default investment fund, a low-risk but comparatively low-yield stable value fund. Partially because of this, DC participants were receiving significantly less replacement income in retirement than had been projected. Nebraska made a new cash balance plan the primary pension plan for state and local employees hired on or after January 1, 2003.[49]

One reason for the slow spread of cash balance plans into the public sector may be that, after an initial burst of interest in them in the private sector, legal questions arose that effectively stopped their implementation for a number of years. These issues appear to be largely resolved now. As will be described below, some early features that were unpopular with employees are no longer legal. The question of whether CB plans constitute age discrimination seems to have been put to rest. Implementation of CB plans by a number of private employers has shown that

these plans can be structured in ways that benefit younger workers while not harming older workers who expected back-end-loaded benefits based on their long service.

What are cash balance defined benefit pensions? The U.S. Department of Labor defines cash balance plans as follows:[50]

> A cash balance plan is a defined benefit plan that defines the benefit in terms that are more characteristic of a defined contribution plan. In other words, a cash balance plan defines the promised benefit in terms of a stated account balance….
>
> In a typical cash balance plan, a participant's account is credited each year with a pay credit (such as 5 percent of compensation from his or her employer) and an interest credit (either a fixed rate or a variable rate that is linked to an index such as the one-year Treasury bill rate). Increases and decreases in the value of the plan's investments do not directly affect the benefit amounts promised to participants. Thus, the investment risks and rewards on plan assets are borne solely by the employer.
>
> When a participant becomes entitled to receive benefits under a cash balance plan, the benefits that are received are defined in terms of an account balance. For example, assume that a participant has an account balance of $100,000 when he or she reaches age 65. If the participant decides to retire at that time, he or she would have the right to an annuity. Such an annuity might be approximately $10,000 per year for life. In many cash balance plans, however, the participant could instead choose (with consent from his or her spouse) to take a lump sum benefit equal to the $100,000 account balance.
>
> In addition to generally permitting participants to take their benefits as lump sum benefits at retirement, cash balance plans often permit vested participants to choose (with consent from their spouses) to receive their accrued benefits in lump sums if they terminate employment prior to retirement age.
>
> Traditional defined benefit pension plans do not offer this feature as frequently….
>
> If a participant receives a lump sum distribution, that distribution generally can be rolled over into an Individual Retirement Account (IRA) or to another employer's plan if that plan accepts rollovers….
>
> While both traditional defined benefit plans and cash balance plans are required to offer payment of an employee's benefit in the form of a series of payments for life, traditional defined benefit plans define an employee's benefit as a series of monthly payments for life to begin at retirement, but cash balance plans define the benefit in terms of a stated account balance. These accounts are often referred to as hypothetical accounts because they do not reflect actual contributions to an account or actual gains and losses allocable to the account.

Like traditional defined benefit pensions, cash balance pensions in private firms are insured by the PBGC.

Why CB plans may appeal to some employers and employees. Cash balance plans look in some ways like DC plans to workers but are funded, administered, and regulated as defined benefit

plans.[51] Private firms had some tax incentives to convert from traditional DB plans to CB plans rather than to DC plans, but research suggests that firms that operated in tight labor markets with younger, more mobile workers were more strongly motivated by a desire to serve the needs of their employees.[52] CB plans do not penalize worker mobility yet do not force workers to take on the investment risk associated with managing their own investment accounts. CB plans do not remove all investment risk from employers, especially for plans that guarantee a fixed interest credit; but the risks are much less than with traditional DB plans. With CB plans, employers do not have to worry that employees will unwisely choose not to participate. They also find that employees understand CB plans better than they understand traditional DB plans and therefore give the employer more credit for providing the retirement benefit.[53] Employers, increasingly concerned about how to attract and/or retain older workers, also tend to appreciate the fact that CB plans do not penalize older employees who work beyond normal retirement age and do not create incentives for early retirement.[54]

Objections to CB plans. The editors of a special journal issue devoted to hybrid pensions in the United States introduced the volume by saying:

> …hybrid pensions have proven very controversial in the United States. At least some of the controversy is not about hybrid designs per se but about the process of converting from a defined benefit to a hybrid plan and whether the legislation adequately protects workers in the conversion process. In addition, hybrids are a relatively new form of provision and it has proven challenging to handle hybrid pensions within the existing U.S. regulatory framework. Further, it is clear to us that understanding of the features of hybrids is not as advanced as for more traditional forms of benefit provision.[55]

Older workers in companies that were converting from DB to CB plans had a number of concerns. Some employees objected to the loss of early retirement benefits, since early retirement incentives are not generally part of CB plans. Some objected to being moved into a plan that provided similar benefits to workers of all ages (e.g., similar employer contribution rates) as they were nearing the point in their careers when their pension wealth would have started to grow significantly under a traditional back-loaded defined benefit plan. In some companies, the value of older workers' transition accounts were calculated in such a way that the worker would not be eligible for new employer contributions for some period of time (a situation called "wear away"). Congress held hearings and considered bills to stop conversions. A number of lawsuits were filed against employers attempting to stop CB plans on a number of

grounds, including age discrimination. A trial court in a case against IBM ruled in 2003 that cash balance plans inherently and illegally discriminated on the basis of age. The age discrimination ruling was, however, overruled by an appellate court in 2006; and in 2007 the U.S. Supreme Court refused to hear arguments challenging that decision.

Amid the controversy, however, the Internal Revenue Service in 1999 stopped approving new cash balance plans, approval which is required in order to protect the tax-advantaged status of these plans. Companies that had already adopted such plans were free to continue them but lived in the shadow of what the courts and Congress might decide about age discrimination and other issues.

In 2006 Congress passed the Pension Protection Act, which resolved a number of outstanding issues about cash balance plans created after June 30, 2005. Among other things, it prohibits "wear away" in new plans and makes it clear that these new plans will not be subject to age-discrimination challenges as long as they include certain features.

The controversies that have arisen with regard to private sector CB plans seem, in any event, less likely to apply to public sector plans. Because, as previously noted, state constitutions and statutes make it difficult to change public pension benefits for current workers, states are not as likely as private firms to consider converting their existing employees from one type of pension plan to another. Governments, however, can and arguably should consider whether a different pension structure for future workers would be desirable.

There has been some research on the cost of CB defined benefit plans vs. traditional final-average-salary DB plans. One study of firms that had converted to CB as of 1998 concluded that pension liabilities for the majority increased. The authors note that this would not have been the case if benefits were held to the amounts employees had a legal claim to; so they concluded that employers increased benefits during the conversion.[56] This might have been done, for example, to compensate older workers for some of the future benefits they would have received under the old DB plan. Another study determined that the costs of grandfathering older workers' benefits can be substantial.[57] Whether or not pension costs increase for employers under a CB plan, however, costs become more predictable because the percentage of salary the employer is required to contribute is known and the rate of return the employer must credit to the employees' hypothetical accounts is tied to market rates.

Conclusion

A number of years ago an ERISA Advisory Council working group on hybrid pensions observed that "cash balance plans and other account-base defined benefit plan formats are no more than retirement-plan design tools, which in themselves are neither 'good' nor 'bad'."[58] This is a useful caveat to keep in mind about teacher pension plans in general. As we have seen, the boundaries among the various types of pensions are porous. Rather than arguing about whether existing arrangements are good or bad, discussions about whether pension reform is needed might more usefully begin by seeking agreement on the objectives being sought in a retirement benefits program. Then it would be appropriate to examine various plan types and features with an eye on whether existing arrangements or some new combination would best meet those objectives. Where teacher pensions are concerned, this paper has raised some questions about objectives that merit re-examination, some arising from the financial pressures placed on plan sponsors and some from inequities in the distribution of current plan benefits. It has also offered an initial look at some of the options available for rethinking teacher pension design, including one that to date may have received too little attention in the public sector.

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
AK	Alaska Teachers Retirement System	No	60.9	6/30/2005	8.65%	21.00%	6/30/2006
AL	Retirement Systems of Alabama / Alabama Teachers	Yes	83.6	9/30/2005	5.00%	8.17%	9/30/2006
AR	Arkansas Teachers Retirement System	Yes	80.3	6/30/2006	Non-contributory for some members; those who contribute are required to contribute 6.0%	14.00%	6/30/2006
AZ	Arizona State Retirement System	Yes	84.9	6/30/2005	7.40%	7.40%	6/30/2006
CA	California State Teachers Retirement System	No	87	6/30/2006	8.00%	8.25%	6/30/2006
CO	Denver Public Schools Retirement System	No	87.6	1/1/2007	8.00%	14.47%	12/31/2006
CO	Colorado Public Employees Retirement Association / Colorado School	No	74.1	12/31/2006	8.00%	10.65%	12/31/2006
CT	Connecticut Teachers Retirement Board	No	63	6/30/2006	7.0%, including 1.0% for retiree medical benefits	15.28%	6/30/2006
DC	District of Columbia Retirement Board / DC Teachers	No	100	10/1/2006	8.00%	0%	9/30/2006

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
DE	Delaware Public Employees Retirement System	Yes	103.7%	6/30/2006	3.0% of earnings above $6,000	6.10%	6/30/2007
FL	Florida Retirement System	Yes	105.6	7/1/2006	non-contributory	6.28%	6/30/2006
GA	Georgia Teachers Retirement System	Yes	96.5	6/30/2006	5.00%	9.28%	6/30/2007
HI	Hawaii Employees Retirement System	Yes	65	6/30/2006	Hybrid plan participants contribute 6.0%	13.75%	6/30/2006
IA	Iowa Public Employees Retirement System	Yes	90.2	6/30/2007	3.70%	5.75%	6/30/2007
ID	Idaho Public Employee Retirement System	Yes	95.2	7/1/2006	6.23%	10.39%	6/30/2006
IL	Illinois Teachers Retirement System	No	62	7/1/2006	9.40%	7.64%	6/30/2006
IL	Chicago Public School Teachers Pension and Retirement Fund	No	78	6/30/2006	9.00%	1.86%	6/30/2006
IN	Indiana State Teachers Retirement Fund	Yes	44.3	6/30/2006	3%	13.22%	6/30/2006
KS	Kansas Public Employees Retirement System	Yes	69.4	12/31/2006	4.00%	6.77%	6/30/2007
KY	Kentucky Teachers Retirement System	No	73.1	6/30/2006	9.855%	13.105%	6/30/2006

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
LA	Louisiana Teachers Retirement System	No	67.5	6/30/2006	8.00%	15.90%	6/30/2006
MA	Massachusetts Teachers Retirement Board	No	69.6	1/1/2002	5% to 11%, depending on member's date of entry		12/31/2003
MD	Maryland State Retirement and Pension System / Maryland Teachers	Yes	84.2	6/30/2006	2.0% for most public school teachers	11.17%	6/30/2006
ME	Maine Public Employees Retirement System / Maine State and Teacher	No	69.7	6/30/2005	7.65%	17.23%	6/30/2006
MI	Michigan Public School Employees Retirement System	Yes	79.3	9/30/2005	3.0% of first $5,000 of pay, plus 3.6% of next $10,000, plus 4.3% of pay above $15,000	7.60%	9/30/2006
MN	Minnesota Teachers Retirement Association	Yes	92.1	6/30/2007	5.00%	9.00%	6/30/2007
MN	Duluth Teachers Retirement Fund Association	Yes	84.1	7/1/2006	5.50%	5.79%	6/30/2006
MN	St. Paul Teachers' Retirement Fund Association	Yes	69.1	6/30/2006	8.00%	8.33%	6/30/2006
MO	Missouri Public Schools Retirement System / Missouri Teachers	No	83.5	6/30/2007	12.00%	12.00%	6/30/2007

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
MS	Mississippi Public Employees Retirement System	Yes	73.5	6/30/2006	7.25%	11.30%	6/30/2007
MT	Montana Teachers Retirement System	Yes	76.1	7/1/2006	7.15%	7.58%	6/30/2006
NC	North Carolina Retirement Systems / North Carolina Teachers and State Employees	Yes	106.5	12/31/2005	6.00%	2.66%	6/30/2006
ND	North Dakota Teachers Fund for Retirement	Yes	75.4	7/1/2006	7.75%	7.75%	6/30/2006
NE	Nebraska Retirement Systems	Yes	87.2	7/1/2006	7.98%	8.76%	6/30/2006
NH	New Hampshire Retirement System	Yes	61.4	6/30/2005	6.66%	5.81%	6/30/2006
NJ	New Jersey Division of Pension and Benefits / New Jersey Teachers	Yes	78	6/30/2006	5.00%	1%	6/30/2006
NM	New Mexico Educational Retirement Board	Yes	68.3	6/30/2006	7.75%	10.15%	6/30/2006
NV	Nevada Public Employees Retirement System / Nevada Regular Employees	No	76.5	6/30/2006	10.31%, paid by employers for most members, in lieu of salary increases or by salary reduction as certified by employers	10.31%; most employers also pay employee contributions, in lieu of salary increases or by salary reduction	6/30/2006

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
NY	New York City Teachers Retirement System	Yes	100	6/30/2004	3.0% for first 10 years of service	15.788%	6/30/2005
NY	New York State Teachers Retirement System	Yes	102.6	6/30/2006	0% for Tiers 1 and 2; 3.0% for Tiers 3 and 4 until the participant accrues 10 years of service	8.60%	6/30/2007
OH	Ohio State Teachers Retirement System	No	82.2	6/30/2007	10.00%	14.0%, including 1.0% for retiree health care	6/30/2007
OK	Oklahoma Teachers Retirement System	Yes	49.3	6/30/2006	7.00%	13.43%	6/30/2006
OR	Oregon Employees Retirement System	Yes	110.5	12/31/2006	non-contributory for the DB plan; 6.0% for the individual accounts	16.97%	6/30/2007
PA	Pennsylvania Public School Employees Retirement System	Yes	81.2	6/30/2005	7.50%	6.46%	6/30/2007
RI	Rhode Island Employees Retirement System / Rhode Island ERS	Yes	55.8	6/30/2004	9.50%	14.84% for teachers (slightly less for districts not participating in 1990 early retirement incentive)	6/30/2005
SC	South Carolina Retirement Systems / South Carolina RS	Yes	69.6	7/1/2006	6.50%	8.05%	6/30/2007
SD	South Dakota Retirement System	Yes	96.7	6/30/2006	6.00%	6.00%	6/30/2006

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
TN	Tennessee Consolidated Retirement System / TN State and Teachers	Yes	99.8	7/1/2005	5%	6.13%	6/30/2006
TX	Teacher Retirement System of Texas	No	89.2	8/31/2007	6.9%, which includes 0.5% for health care benefits	7.98%, which includes 1.4% for health care benefits	8/31/2007
UT	Utah Retirement Systems	Yes	96.4	12/31/2006	non-contributory	13.38%	12/31/2006
VA	Virginia Retirement System	Yes	81.3	6/30/2005	5.00%	6.62%	6/30/2006
VA	Educational Employees' Supplementary Retirement System of Fairfax County	Yes	84.9	12/31/2005	4.00%	3.37%	6/30/2006
VT	Vermont Teachers Retirement System	Yes	84.6	6/30/2006	3.90%	4.81%	6/30/2006
WA	Washington Department of Retirement Systems / Washington Teachers Plan 1	Yes	77.6	9/30/2005	6.00%	1.37%	6/30/2006
WA	Washington Department of Retirement Systems / Washington Teachers Plan 2/3	Yes	100	9/30/2004	0.87% for Plan 2 members; Plan 3 members may contribute 5% to 15% to the defined contribution plan component	1.37%	6/30/2006
WI	Wisconsin Retirement System	Yes	99.5	12/31/2005	5.00%	4.70%	12/31/2005

APPENDIX TABLE A-1

State	Plan Name	Social Security	Actuarial Funding Ratio	Actuarial Valuation Date	Employee Contribution Rate	Employer Contribution Rate	for FY ended
WV	West Virginia Consolidated Public Retirement Board / West Virginia Teachers	Yes	31.6	6/30/2006	6.00%	24.13%	6/30/2006
WY	Wyoming Retirement System	Yes	94.4	1/1/2007	5.68%	5.57%	12/31/2006

Source: The Public Fund Survey, available at <http://www.publicfundsurvey.org> accessed on March 27, 2008.

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
AK	Alaska Teachers Retirement System	60/8, any/20	55/8	automatic, based on a % of the CPI depending on retiree's age	6/30/2006	2% for first 20 years, 2.5% thereafter
AL	Retirement Systems of Alabama / Alabama Teachers	any/25, 60/10	na	ad hoc as approved by the legislature	9/30/2006	2.0125%
AR	Arkansas Teachers Retirement System	any/28, 60/5	any/25	automatic, based on CPI, rounded to the nearest one-half of one %, with a 3% maximum for Plan A members and 2% for Plan B; simple	6/30/2006	2.15%
AZ	Arizona State Retirement System	65/any, 62/10, Rule of 80	50/5	based on excess earnings above 8%, up to 4% annually	6/30/2006	2.1% for first 20 years, 2.15% for 20 to 25 years, 2.2% for 25 to 30 years, and 2.3% for 30 or more years
CA	California State Teachers Retirement System	60/5	55/5, 50/30	automatic 2% simple	6/30/2006	2.0%, rising to 2.4% at age 63
CO	Denver Public Schools Retirement System	65/5, 55/25, 50/30	any/25, 55/15	automatic 3.25% compounded	12/31/2006	2.5%
CO	Colorado Public Employees Retirement Association / Colorado School	50/30, Rule of 80 at age 55, 65/5	50/25, 55/20	automatic 3.5% compounded	12/31/2006	2.5%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
CT	Connecticut Teachers Retirement Board	60/20, any/35	any/25, 60/10	for members who retired before 9/92, automatic, based on CPI, with 3% minimum and 5% max, compounded;	6/30/2006	2%
DC	District of Columbia Retirement Board / DC Teachers	62/5, 60/20, 55/30	any/25, 50/20	automatic based on CPI, compounded, maximum of 3% for those hired after November 15, 1996	9/30/2006	2%
DE	Delaware Public Employees Retirement System	62/5, 60/15, any/30	55/15, any/25	ad hoc as approved by the general assembly	6/30/2007	1.85%
FL	Florida Retirement System	62/6, any/30	any/6	automatic 3% compounded	6/30/2006	1.60%
GA	Georgia Teachers Retirement System	60/10, any/30	any/25	automatic 1.5% every 6 months as long as CPI increases, compounded	6/30/2007	2%
HI	Hawaii Employees Retirement System	62/5, 55/30 for hybrid plan	55/20	automatic 2.5% simple	6/30/2006	2%
IA	Iowa Public Employees Retirement System	65/any, 62/20, Rule of 88	55/any	Non-guaranteed post-retirement payment from a reserve account established from excess investment earnings. Calculation includes factors related to num	6/30/2007	2%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
ID	Idaho Public Employee Retirement System	65/5	55/5	automatic 1% compounded (as long as CPI rises at least 1%), plus investment-based increase	6/30/2006	2.0%
IL	Illinois Teachers Retirement System	62/5, 60/10, 55/35	55/20	automatic 3% compounded	6/30/2006	2.2% for service after 7/1/98; for previous service: 1.67% for first 10 years; 1.9% for next ten years, 2.1% for next ten years, and 2.3 % for years above 30. Members may upgrade service earned before 7/1/98 to 2.2% thru service purchase
IL	Chicago Public School Teachers Pension and Retirement Fund	55/20, 62/5	55/20	automatic 3% compounded	6/30/2006	2.2%; 1.67% for service before 7/1/98 for each of first 10 years, 1.9% for years 11-20, 2.1% for years 21-30, and 2.3% for each year above 30. Svc earned before 7/1/98 can be upgraded to 2.2% thru higher ee contributions
IN	Indiana State Teachers Retirement Fund	65/10, 60/15, Rule of 85 at age 55	50/15	ad hoc	6/30/2006	1.1% plus a DC component
KS	Kansas Public Employees Retirement System	65/any, 62/10, Rule of 85	55/10	ad hoc as approved by the legislature	6/30/2007	1.75%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
KY	Kentucky Teachers Retirement System	60/27, 55/5	55/5	automatic 1.5% compounded	6/30/2006	2.5%, 3.0% if the member retires with 30 years of service; members joining after 6/30/02 who accrue less than 10 yrs of service receive 2.0%
LA	Louisiana Teachers Retirement System	60/5, 55/25, any/30	60/5, any/20	based on investment return	6/30/2006	2.5%
MA	Massachusetts Teachers Retirement Board	65/10, any/20	55/10	ad hoc as approved by the legislature; based on CPI up to 3% for first $12,000 of benefit; compounded	12/31/2003	2.5%; teachers who elected into RetirementPlus and have 30 or more years of service receive an additional 2% for each year of service above 24
MD	Maryland State Retirement and Pension System / Maryland Teachers	any/30, 62/5, 63/4, 64/3, 65/2	55/15	automatic based on CPI, up to 3%, compounded	6/30/2006	larger of: 1) 1.2% of FAS for service prior to 6/30/98; 2) 0.8% FAS up to SSIL* plus 1.5% FAS above that level for service prior to 6/30/98; 3) 1.4% FAS after 6/30/98
ME	Maine Public Employees Retirement System / Maine State and Teacher	60/5, 62/5, 62/10	any/25	automatic, based on CPI up to 4%, compounded	6/30/2006	2%
MI	Michigan Public School Employees Retirement System	any/30, 60/10	55/15	automatic 3% simple	9/30/2006	1.5%
MN	Minnesota Teachers Retirement Association	Upon attaining normal Social Security retirement age, not to exceed 66	55/3	automatic based on CPI, compounded, up to 2.5%, plus an increase based on investment performance	6/30/2007	1.7%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
MN	Duluth Teachers Retirement Fund Association	Same as age of eligibility for full Social Security benefits, not to exceed age 66	55/3	automatic 2% compounded, plus a share of investment earnings when the portfolio returns exceed 8.5%	6/30/2006	1.7%
MN	St. Paul Teachers' Retirement Fund Association	65/3	55/3	automatic 2.0% plus an excess investment earnings component	6/30/2006	1.7%
MO	Missouri Public Schools Retirement System / Missouri Teachers	60/5, any/30, Rule of 80	55/5, any/25	automatic based on CPI, not to exceed 5%, compounded, with a lifetime cap of 80%	6/30/2007	2.5%; 2.55% for 31 or more years of service
MS	Mississippi Public Employees Retirement System	60/4, any/25	none	automatic 3% compounded	6/30/2007	2.0% for the first 25 years and 2.5% for each year thereafter
MT	Montana Teachers Retirement System	any/25, 60/5	50/5	automatic 1.5% compounded beginning 3 years after onset of annuity	6/30/2006	1.667%
NC	North Carolina Retirement Systems / North Carolina Teachers and State Employees	65/5, 60/25, any/30	60/5, 50/20	ad hoc	6/30/2006	1.82%
ND	North Dakota Teachers Fund for Retirement	65/3, Rule of 85	55/3	ad hoc as approved by the legislature	6/30/2006	2%
NE	Nebraska Retirement Systems	65/5, Rule of 85, any/35	60/5	based on CPI, up to 2.5%, compounded	6/30/2006	2%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
NH	New Hampshire Retirement System	60/any	Rule of 70 with 20 years of service or age 50 with 10 years of service	ad hoc as approved by the legislature's fiscal committee	6/30/2006	1.67% prior to age 65, 1.5% after attaining age 65
NJ	New Jersey Division of Pension and Benefits / New Jersey Teachers	60/10	any/25	automatic 60% of CPI, compounded	6/30/2006	1/55 for each year of service (1.818%)
NM	New Mexico Educational Retirement Board	65/5, any/25, Rule of 75 at age 60	Rule of 75	One-half of CPI up to 4%, with a 2% minimum; annuitant must be 65 years of age to qualify for a COLA	6/30/2006	2.35%
NV	Nevada Public Employees Retirement System / Nevada Regular Employees	65/5, 60/10, any/30	Participants may retire at any time	after 3 years of receiving benefits, auto 2% annually, rising gradually to 5% annually, compounded, after 14 years of benefits	6/30/2006	2.5% for svc earned before 7/1/01 and 2.67% for svc earned thereafter
NY	New York City Teachers Retirement System	62/5, 55/30	55/5	automatic based on CPI, up to 3%, compounded	6/30/2005	1.67% if service is less than 20 years, 2.0% if service is 20 or more years, and 1.5% for each year above 30

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
NY	New York State Teachers Retirement System	62/5, 55/30	55/5	automatic, equal to half the CPI, with a minimum of 1% and a maximum of 3%, compounded, applied to the first $18,000 in annual benefits	6/30/2007	2% up to 30 years (1.67%) if less than 20 years), plus 1.5% for each year above 30
OH	Ohio State Teachers Retirement System	65/30	any/30, 55/25, 60/5	automatic 3% simple	6/30/2007	2.2% up to 30 years; for each year above 30, formula rises by 0.1% per year, beginning with 2.2% for year 31, not to exceed 100% of final average salary; the Combined Plan factor is 1.0%
OK	Oklahoma Teachers Retirement System	62/5, Rule of 90; members who joined before 7/1/92 qualify for the Rule of 80	55/5	ad hoc as approved by the legislature	6/30/2006	2%
OR	Oregon Employees Retirement System	60/5	50/5	based on CPI, compounded, up to 2%	6/30/2007	1.67%
PA	Pennsylvania Public School Employees Retirement System	62/1, 60/30, any/35	55/25	ad hoc as approved by the general assembly	6/30/2007	2.5%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
RI	Rhode Island Employees Retirement System / Rhode Island ERS	65/10, 59/29	55/20	based on CPI, up to 3%, compounded; effective after 3rd anniversary of retirement	6/30/2005	1.6% for first 10 yrs, 1.8% for yrs 11-20, 2.0% for yrs 21-25, 2.25% for yrs 26-30, 2.5% for yrs 31-37, 2.25% for yr 38
SC	South Carolina Retirement Systems / South Carolina RS	65/5, any/28	60/5, 55/25	automatic one percent compounded	6/30/2007	1.82%
SD	South Dakota Retirement System	65/3, Rule of 85; 55/3	55/3;	automatic 3.1% compounded	6/30/2006	Higher of Enhanced Benefit, which is 1.625% for svc before 7/1/02 plus Base Benefit: 1.55% for svc after 7/1/02 ; or Alternate Benefit--see SDRS website for details
TN	Tennessee Consolidated Retirement System / TN State and Teachers	60/5, any/30	55/5, any/25	automatic based on CPI, up to 3% compounded	6/30/2006	1.5% plus .25% of FAS over SSIL
TX	Teacher Retirement System of Texas	65/5, Rule of 80	55/5, 50/30	ad hoc, as approved by the legislature	8/31/2007	2.3%
UT	Utah Retirement Systems	any/30, 65/4	any/25, 60/20, 62/10	automatic based on CPI up to 3% simple	12/31/2006	2%
VA	Virginia Retirement System	65/5, 50/30	50/10, 55/5	automatic based on CPI up to 5%	6/30/2006	1.7%
VA	Educational Employees' Supplementary Retirement System of Fairfax County	60/5, any/30	na	automatic 3% compounded	6/30/2006	.8%

APPENDIX TABLE A-2

State	Plan Name	Normal Retirement (age/svc)	Early Retirement (age/svc)	Post-Retirement Increase Provisions	for FY ended	Benefit Factor
VT	Vermont Teachers Retirement System	62/any, any/30	55/5	automatic based on one-half of CPI, up to 5%, compounded	6/30/2006	1.67% up to 50% of FAS
WA	Washington Department of Retirement Systems / Washington Teachers Plan 1	any/30, 60/5, 55/25			6/30/2006	2%
WA	Washington Department of Retirement Systems / Washington Teachers Plan 2/3	65/any	55/20 for Plan 2; 55/10 for Plan 3; 55/30 for either plan with a 3% per year discount	automatic based on CPI up to 3%, compounded	6/30/2006	2.0% for Plan 2 members; 1.0% for Plan 3
WI	Wisconsin Retirement System	65/any	55/any	based on investment returns	12/31/2005	1.6%; 1.765% for service before 2000
WV	West Virginia Consolidated Public Retirement Board / West Virginia Teachers	60/5, 55/30, any/35			6/30/2006	2%
WY	Wyoming Retirement System	60/4, Rule of 85	50/4; any/25	Automatic, lesser of 3% or the increase in the cost of living as determined by the board, effective each July 1 after two full years of retirement	12/31/2006	2.125% for first 15 years, 2.25% for each year of service thereafter

Source: The Public Fund Survey, available at <http://www.publicfundsurvey.org> accessed on March 27, 2008.

APPENDIX TABLE A-3

State	Plan Name	Actuarial Valuation Method	Investment Return Assumption	Inflation Assumption	Assumed Real Rate of Return	Actuarial Valuation Date
AK	Alaska Teachers Retirement System	PUC	8.25%	3.50%	4.75%	6/30/2005
AL	Retirement Systems of Alabama / Alabama Teachers	Entry age	8.00%	4.50%	3.50%	9/30/2005
AR	Arkansas Teachers Retirement System	Entry Age	8.00%	4.00%	4.00%	6/30/2007
AZ	Arizona State Retirement System	PUC	8.00%	4.25%	3.75%	6/30/2005
CA	California State Teachers Retirement System	Entry age	8.00%	3.25%	4.75%	6/30/2006
CO	Denver Public Schools Retirement System	Entry age	8.50%	4.50%	4.00%	1/1/2007
CO	Colorado Public Employees Retirement Assn. / Colorado School	Entry age	8.50%	3.75%	4.75%	12/31/2006
CT	Connecticut Teachers Retirement Board	Entry age	8.50%	4.00%	4.50%	6/30/2006
DC	District of Columbia Retirement Board / DC Teachers	Aggregate cost	7.25%	5.00%	2.25%	10/1/2006
DE	Delaware Public Employees Retirement System	Entry age	8.00%	3.75%	4.25%	6/30/2007
FL	Florida Retirement System	Entry age	7.75%	3.00%	4.75%	7/1/2007
GA	Georgia Teachers Retirement System	Entry age	7.50%	3.75%	3.75%	6/30/2006
HI	Hawaii Employees Retirement System	Entry age	8.00%	3.00%	5.00%	6/30/2006
IA	Iowa Public Employees Retirement System	Entry age	7.50%	3.50%	4.00%	6/30/2007
ID	Idaho Public Employee Retirement System	Entry age	7.75%	3.75%	4.00%	7/1/2007
IL	Illinois Teachers Retirement System	PUC	8.50%	3.50%	5.00%	7/1/2006
IL	Chicago Public School Teachers Pension and Retirement Fund	PUC	8.00%	3.00%	5.00%	6/30/2006
IN	Indiana State Teachers Retirement Fund	Entry age	7.50%	4.50%	3.00%	6/30/2006

APPENDIX TABLE A-3

State	Plan Name	Actuarial Valuation Method	Investment Return Assumption	Inflation Assumption	Assumed Real Rate of Return	Actuarial Valuation Date
KS	Kansas Public Employees Retirement System	Entry Age Normal	8.00%	3.50%	4.50%	12/31/2006
KY	Kentucky Teachers Retirement System	PUC	7.50%	4.00%	3.50%	6/30/2006
LA	Louisiana Teachers Retirement System	PUC	8.25%	3.20%	5.05%	6/30/2006
MA	Massachusetts Teachers Retirement Board	Entry age	8.25%	3.50%	4.75%	1/1/2002
MD	Maryland State Retirement and Pension System / Maryland Teachers	Entry Age	7.75%	4.00%	3.75%	6/30/2006
ME	Maine Public Employees Retirement System / Maine State and Teacher	Entry age	7.75%	4.50%	3.25%	6/30/2005
MI	Michigan Public School Employees Retirement System	Entry age	8.00%	3.50%	4.50%	9/30/2005
MN	Minnesota Teachers Retirement Association	Entry age	8.50%	5.00%	3.50%	6/30/2007
MN	Duluth Teachers Retirement Fund Association	Entry age	8.50%	5.00%	3.50%	7/1/2006
MN	St. Paul Teachers' Retirement Fund Association	Entry age	8.50%	5.00%	3.50%	6/30/2006
MO	Missouri Public Schools Retirement System / Missouri Teachers	Entry age	8.00%	3.25%	4.75%	6/30/2007
MS	Mississippi Public Employees Retirement System	Entry age	8.00%	4.00%	4.00%	6/30/2007
MT	Montana Teachers Retirement System	Entry age	7.75%	3.50%	4.25%	7/1/2006
NC	North Carolina Retirement Systems / North Carolina Teachers and State Employees	Entry age	7.25%	3.75%	3.50%	12/31/2005
ND	North Dakota Teachers Fund for Retirement	Entry age	8.00%	3.00%	5.00%	7/1/2006
NE	Nebraska Retirement Systems	Entry age	8.00%	3.50%	4.50%	7/1/2006

APPENDIX TABLE A-3

State	Plan Name	Actuarial Valuation Method	Investment Return Assumption	Inflation Assumption	Assumed Real Rate of Return	Actuarial Valuation Date
NH	New Hampshire Retirement System	Open group agg	8.50%	3.50%	5.00%	6/30/2005
NJ	New Jersey Division of Pension and Benefits / New Jersey Teachers	PUC	8.25%	3.00%	5.25%	6/30/2006
NM	New Mexico Educational Retirement Board	Entry age	8.00%	3.00%	5.00%	6/30/2006
NV	Nevada Public Employees Retirement System / Nevada Regular Employees	Entry age	8.00%	3.50%	4.50%	6/30/2006
NY	New York City Teachers Retirement System	Frozen Initial Liability	8.00%	2.50%	5.50%	6/30/2004
NY	New York State Teachers Retirement System	Aggregate cost	8.00%	3.00%	5.00%	6/30/2006
OH	Ohio State Teachers Retirement System	Entry age	8.00%	3.50%	4.50%	6/30/2007
OK	Oklahoma Teachers Retirement System	Entry age	8.00%	3.00%	5.00%	6/30/2006
OR	Oregon Employees Retirement System	Project Unit Credit	8.00%	2.75%	5.25%	12/31/2006
PA	Pennsylvania Public School Employees Retirement System	Entry age	8.50%	3.25%	5.25%	6/30/2006
RI	Rhode Island Employees Retirement System / Rhode Island ERS	Entry age	8.25%	3.00%	5.25%	6/30/2004
SC	South Carolina Retirement Systems / South Carolina RS	Entry age	7.25%	3.00%	4.25%	7/1/2006
SD	South Dakota Retirement System	Entry age	7.75%	4.00%	3.75%	6/30/2006
TN	Tennessee Consolidated Retirement System / TN State and Teachers	Frozen Entry Age	7.50%	0.00%	n/a	7/1/2005
TX	Teacher Retirement System of Texas	Entry age	8.00%	3.00%	5.00%	8/31/2007
UT	Utah Retirement Systems	Entry Age	8.00%	3.00%	5.00%	12/31/2006
VA	Virginia Retirement System	Entry age	7.50%	2.50%	5.00%	6/30/2006

APPENDIX TABLE A-3

State	Plan Name	Actuarial Valuation Method	Investment Return Assumption	Inflation Assumption	Assumed Real Rate of Return	Actuarial Valuation Date
VA	Educational Employees' Supplementary Retirement System of Fairfax County	Entry age	7.50%	3.75%	3.75%	12/31/2005
VT	Vermont Teachers Retirement System	Entry age frozen	8.25%	3.00%	5.25%	6/30/2006
WA	Washington Department of Retirement Systems / Washington Teachers Plan 1	Frozen initial liability	8.00%	3.50%	4.50%	9/30/2005
WA	Washington Department of Retirement Systems / Washington Teachers Plan 2/3	Aggregate cost	8.00%	3.50%	4.50%	9/30/2004
WI	Wisconsin Retirement System	Frozen Entry Age	7.80%	4.10%	3.70%	12/31/2005
WV	West Virginia Consolidated Public Retirement Board / West Virginia Teachers	Entry age	7.50%	3.00%	4.50%	6/30/2006
WY	Wyoming Retirement System	Entry age	8.00%	3.00%	5.00%	1/1/2007

Source: The Public Fund Survey, available at <http://www.publicfundsurvey.org> accessed on March 27, 2008.

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