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BETTER BENEFITS:

Reforming Teacher Pensions for a Changing Work Force

By Chad Aldeman and Andrew J. Rotherham

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In 2002, Pennsylvania legislators thought the state's pension plan was sitting pretty. Feeling flush from the stock market boom of the 1990s, actuaries told the Legislature the fund had \$7 billion more than it would need to cover financial obligations to current and future teacher retirees. In response, the Legislature contributed only a tiny fraction of what it had been giving, while simultaneously increasing teacher retirement benefits.

The combination of low contribution rates and enhanced benefits has been haunting Pennsylvania ever since. By early 2010, its \$7 billion surplus had vanished, replaced by a \$10 billion deficit. The state's head actuary is now projecting that to meet future obligations, state and district contributions will have to increase nearly eight-fold between 2010 and 2014.¹

Pennsylvania's case, unfortunately, is not unusual. After one of the worst decades in stock market history, the Great Recession has left nearly every state pension plan in a precarious position. Recently, the Pew Center on the States reported that 47 states owe more in pension obligations for current and future teacher retirees than they have on hand. Collectively, the gap between what states have and what they will need totals almost \$500 billion.² And with Americans living longer and teachers more likely to retire at a younger age, the challenge of paying for teacher retirements will only increase.

Policymakers are beginning to take note of the fiscal problems in teacher retirement systems. States have recently taken action by raising retirement ages, lowering benefit payments, and reducing cost-of-living adjustments.³ These are small steps toward shoring up the system to help ensure that it remains sustainable in the future.

But the problems with teacher pensions are not just financial. And they do not just affect individual teachers and retirees. The way these plans are structured can negatively influence the teaching work force as a whole. At a time when improving the quality of classroom instruction is a national priority, key structural elements in teacher retirement plans

impair the ability of schools to recruit, hire, retain, and compensate high-quality teachers and principals.

For example, while the current set-up works well for those who qualify for it, it shortchanges teachers who leave the profession or switch between state or municipal systems. In other words, it creates some big winners at the expense of many small losers. It also features elements that compel teachers to stay on the job, regardless of burnout or a desire to pursue a new career, until they reach a certain career milestone, after which they retire immediately or else begin to lose out financially. None of these elements is likely to draw good talent to the field or address the human capital problems that America's public schools are facing.

Underfunded and poorly structured teacher retirement systems are problems that the country cannot afford to ignore. But reforming these systems is complicated and difficult. Recent moves by states to quickly raise revenue or decrease benefits do not provide the long-term fixes needed to fully address fiscal issues as well as human capital or teacher quality concerns. And there are significant political and legal barriers to reforming pension systems, ranging from meeting the interests of powerful teachers unions to amending state constitutions that prohibit any changes.

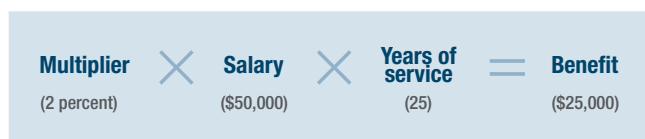
Still, there are steps that can be taken to modernize the system. Some address the technical aspects or basic structure of plans; others tackle the political obstacles or legal limitations. Some are short term; others are more permanent. They all must be crafted with an eye toward simultaneously creating a sustainable cost structure and improving the quality of the teaching work force.

Comparing Pension Plans

Teachers and other public-sector employees typically have access to a retirement system or pension called a defined benefit plan. Like its name suggests, the employer in a DB plan defines the benefit or promised amount of money the employee will receive in retirement. The employer and employee agree on the employee's contributions, and then the employer determines its investments and annual contribution rate in order to pay the benefits down the road.

An important feature of DB plans is the formula used to determine how much retirees will receive. The formula consists of some factor commonly known as a "multiplier" (a percentage of the employee's salary, usually around 2 percent) multiplied by salary and years of service. So a DB plan with a multiplier of 2 percent would pay an employee with a salary of \$50,000 and 25 years of service \$25,000 a year in retirement. (See Figure 1.) Also, in order to ensure that teacher pensions are not worn away by inflation over the course of retirement, most DB plans include in their calculations an annual cost-of-living adjustment. Some plans set a fixed rate (2 or 3 percent) for cost of living, but others adjust their calculations annually to inflation. Because of compounding interest, one year's cost-of-living adjustments affect the next year's benefits, and so on.

Figure 1. How Defined Benefit Pension Payments Are Calculated



Private-sector workers are more often enrolled in what's called a defined contribution plan. In DC plans, the employer communicates in advance what percentage of an employee's salary they will contribute to his or her retirement account. Employees own the accounts and are responsible for deciding their own contributions and investments.

Public- and private-sector workers' retirements used to be structured more similarly, with both groups more likely to have access to DB plans. But that has

changed over the last 25 years as private-sector employers have abandoned DB plans. In 1985, four-fifths of private-sector workers had access to a DB plan; by 2009, the number was closer to one in five.⁴ In contrast, 89 percent of teachers and 84 percent of all state and local government employees are still enrolled in a DB plan.⁵

In a typical DC plan, employers open 401(k) accounts for their workers and sometimes match a portion of the employee's contributions. Unlike DB plans, where the employer promises some future benefit level at some future point in time, employers must contribute to DC plans with real-time cash contributions. Both employee and employer contributions to the accounts are pre-tax, meaning they are not subject to federal income tax prior to being deposited. The idea is that through contributions and the growth of the investment itself, the account will grow substantially over time. With a few exceptions, workers are unable to access the money before they turn 59½ without incurring tax liability and penalties. At age 70½ or after retirement, whichever comes later, retirees must make certain minimum distributions, but money remaining in the account after their death can pass to their heirs.

Unlike DB plans, DC plans are in workers' names and are portable, meaning employees can take them when they leave. Along with this flexibility, however, comes considerable risk. It is the worker, for instance, who bears the burden of poor investment choices, such as a lack of diversification, meager or negative returns in a down stock market, and insufficient contributions if they elect not to save enough.

DB plans, in contrast, offer much greater predictability for their members. In this case, the institutions responsible for operating the plans, typically state or local governments, carry all the risk. They calculate how much money they'll need to contribute to cover current and future retirees. They employ specialists with the sole job of picking investments that will return a profit over the long run. In other words, DB plans take care of many of the decisions that DC plans hand over to individual employees, who may not be experts at predicting their own budgetary needs or at picking a mix of investments that will help them reach their retirement goals.

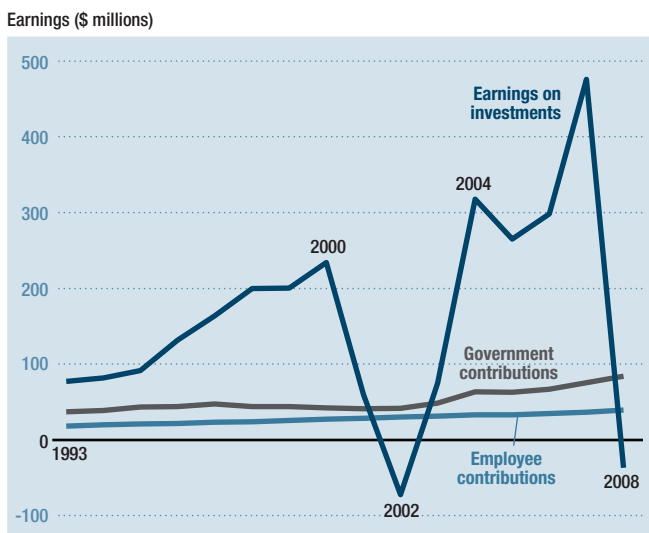
The Problem With Underfunding

Just as an individual can fail to save enough, make a bad investment decision, or overestimate the rate of return they will see from investments, state and local governments can do the same thing. This is why many are scrambling to find ways to raise revenue to cover the shortfalls they face.

Annual employer and employee contributions help fill public pension plan coffers, but as plans become larger over time, they rely more heavily on investment returns. (See Figure 2.) Investment returns made up about two-thirds of the change in public pension plan assets over the 15-year period ending in 2008.⁶ Thus, predictions and assumptions about future investment returns have become all the more important. An investor assuming a large return, for example, can contribute less every year than one who assumes lower returns. (See sidebar “Tricky Assumptions” on page 5.)

Also, as funds rely more on investment returns over time, their total asset values become more susceptible to market fluctuations. When the market rises, pension plan coffers are flush, and actuaries calculate lower contribution rates, or what employers would need to make in order to meet future obligations. When the market falls, those same actuaries ask for

Figure 2. Investment Returns Matter More Over Time



Source: Authors' calculations from <http://www.census.gov/govs/www/retire>.

When the funding ratio falls below 100 percent, it is said to be “underfunded,” because it owes more than it has. Currently, 47 states are underfunded by almost \$452 billion.

higher contribution rates. The goal is a 100 percent “funding ratio,” which means the fund’s total asset value is exactly enough to cover all future payments. When the funding ratio falls below 100 percent, it is said to be “underfunded,” because it owes more than it has. Currently, 47 states are underfunded by almost \$452 billion.⁷

To alleviate the underfunding problem and to calculate what they owe more accurately—as opposed to chasing the most recent results—pension funds use a process called “smoothing.” Here, they use rolling averages of multiple years of returns so that any temporary gains or losses in investment income do not compel the state to swing contributions too far in one direction. This helps maintain focus on the long-term funding ratio, but it does not entirely prevent the state from feeling especially prosperous near the end of long bull markets, such as the technology boom in the late 1990s and the housing-driven bubble from 2002–07, or particularly poor after precipitous drops, such as the 2008–09 recession.

Take Pennsylvania, for example. Feeling flush with money in 2002, the Public School Employees’ Retirement System of Pennsylvania set employer contributions at unsustainably low rates at the same time they increased benefits by increasing the multiplier factor and cost-of-living-adjustments. Then the market dropped, and in 2009 Pennsylvania announced it will be increasing the employer contribution rate for retired teacher pension and health benefits in 2010–11 by 72 percent. The projections into the future are even worse; PSERS is currently predicting the rate to nearly triple by 2012–13.

Figure 3. Pennsylvania's Employer Contributions Fluctuate Wildly

Average contribution (% of compensation)



Source: http://www.psers.state.pa.us/press/pension_funding_issues/index.html.

The fluctuation in employee contribution rates, however, is not altogether atypical. Figure 3 shows a 60-year look, 30 years back and a 30-year projection forward, at employee and employer contributions into PSERS. The gray line is the percentage of salary that the average employee contributes, and it has risen just slightly over time. The blue line is the combined contribution of school districts and the state (determined by formula, but the state contributes a little more than half), and it has fluctuated wildly. It was in double digits from 1973 to 1997, hit a low of 1.09 in 2002, and is expected to reside above 30 percent from 2014 to 2020.

The projections include an 8 percent annual investment gain for the next 30 years, but even after that assumption is added to the large employer contributions, in 2039 the state will still be only 97 percent funded.

The financial problems would be daunting alone if they weren't compounded by demographic trends. The baby boom generation has been well documented, and their impending retirements should not be a surprise to anyone. But the fact that plans are underfunded at the precise time that baby boomers are nearing retirement is a real problem, especially considering Americans are living longer.⁸ The life expectancy for 65-year-old males and females in 1979 was 14.2 and 18.4 years, respectively. Those are now up to 17 and 19.7.⁹

Teachers have even more years in retirement than the typical American, since they retire about four years younger than the national average.¹⁰ Workers make retirement decisions for many reasons, including the amount and the structure of their retirement benefits. Research has found that DB plans, through the assurance provided by guaranteed monthly payments until death, lower the age at which employees are likely to retire by one to two years.¹¹ In other words, based on plan structure alone, public-sector workers are more likely to retire at much younger ages than private-sector employees.

Because DB plans build up a reserve for future benefit payments, these trends would be fully accounted for if the plans were fully funded. But since the plans have not been properly funded over the years, the challenge of paying for the baby boom crunch will fall on future generations.

The Benefits of Defined Benefits

Despite the fiscal woes, the current defined benefit systems do work. They force individuals and their employers to save for retirement at levels much higher than the average private-sector worker. And state pension plans have many advantages over individual investors: They employ full-time investment professionals to manage the accounts; they can invest in market sectors that individuals typically do not have access to; and, perhaps most importantly, the state plans do not have to adjust their investments according to life cycles. (Individual investors are encouraged to invest aggressively when they're young because they're able to weather market fluctuations, but they must adjust their holdings into more conservative, lower-earning investments as they approach retirement. Large DB plans managed by states or localities do not have to make this adjustment and are free to maximize their returns at all times.)

For all of these reasons, state pension funds earn returns that are about 1 percent higher than what the typical individual investor could expect.¹² The overall result is a good one: Millions of retired public teachers and other public servants gain a steady stream of income, adjusted for inflation as they age, that's guaranteed to last their entire lifetime.

Tricky Assumptions

How to value a pension plan's assets against its liabilities has garnered much debate over the last 40 years. And the issue is an important one—figuring out how much you will owe tomorrow will change how much you save today. The arguments are primarily centered on the investment return rate, sometimes called the “discount rate,” that states should assume for their investments and inflation. If they select a higher rate (i.e., assume their investments will grow more quickly), they are able to contribute less today than if they assumed they would grow more slowly.

Most states assume they'll be able to earn about 8 percent, before inflation, on their investments. Historically, this is a conservative estimate. The National Association of State Retirement Administrators found that state plans average a 9.3 percent return for the 25-year period ending December 31, 2009.¹ The median state plan was just under this mark, at 9.25 percent. This period includes both bull and bear markets, including the Great Recession of 2007-09. While the past doesn't predict the future, it shouldn't be ignored either.

Yet, some actuarial analysts, using shorter timeframes to show the volatility involved with these assumptions, argue states should be even more conservative.² Primarily, they point out that teacher retirement liabilities are “risk-free,” that is, the state has little choice but to make the payments. And, if the liabilities are risk-free, this group argues that investments should be risk-free as well. The Government Accounting Standards Board, or GASB, the federal agency responsible for determining rules under which state and local governments have to make their actuarial calculations, appears poised to adopt some middle ground between leaving states to do what they're currently doing and requiring them to assume risk-free

investment return rates.³

GASB has traditionally allowed states to take a long-term view, because a state, unlike a private corporation, is not at risk of going out of business. Consider the state of Illinois, which had the lowest funding ratio of any state pension fund on July, 1, 2008, at 54 percent. This means that if Illinois goes bankrupt, it would only be able to meet 54 percent of its current and future pension obligations. But, unlike private corporations, state governments are able to avoid bankruptcy by increasing taxes, raising contribution rates from participating districts, or issuing bonds. Such options clearly distinguish Illinois from Enron, Trans World Airlines and Bethlehem Steel, all high-profile examples of private corporations that went under and took their DB pension plans, and the employees covered under them, down with them. It's safe to say the state of Illinois will exist, in more or less its current form, for the foreseeable future. Thus, while it's a problem in either venue, unfunded liability in the public and private sector should be looked at differently.

1. Keith Brainard, “Public Pension Plan Investment Return Assumptions,” (Washington, DC: National Association of State Retirement Administrators, March 2010).
2. See, for example, Robert Novy-Marx and Joshua D. Rauh, “Public Pension Promises: How Big Are They and What are They Worth?” December 18, 2009, Available at SSRN: <http://ssrn.com/abstract=1352608>, or Joshua D. Rauh, “Are State Public Pensions Sustainable?” (paper presented at the conference *Train Wreck: A Conference on America's Looming Fiscal Crisis*, Los Angeles, CA, January 2010).
3. *Preliminary Views of the Government Accounting Standards Board: Plain-Language Supplement*, (Washington, DC: Government Accounting Standards Board of the Financial Accounting Foundation, June 2010).

As policymakers look to reform pension plans, the elements that contribute to this stability should be preserved.

Also, while it's true that almost every state is facing a shortfall, it's important to take a more in-depth look at the underfunding issue. Looking at the gap alone ignores what states have already put away. The same report calculating the \$452 billion deficit also showed that states had put away more than \$2.3 trillion in their plans. And even though those funds would need to cover \$2.8 trillion in long-term liabilities, if we consider what states have put away the \$452 billion deficit figure appears more manageable.

A historical context is also useful. While the current funding ratios are less than ideal, they are not

catastrophic. The most recent figures from the Public Fund Survey, a compilation of 101 state and municipal retirement plans, show that the aggregate funding ratio for these plans reached a high of 102 in 2001 at the end of the Internet-led bull market. Through a combination of poor investment returns and benefit enhancements, the ratio had fallen to 85 by July 2008, about where it was in 1994.¹³ The stock market boom of the late 1990s allowed pension funds to avoid making hard choices. But it would be unwise to assume that will happen again.

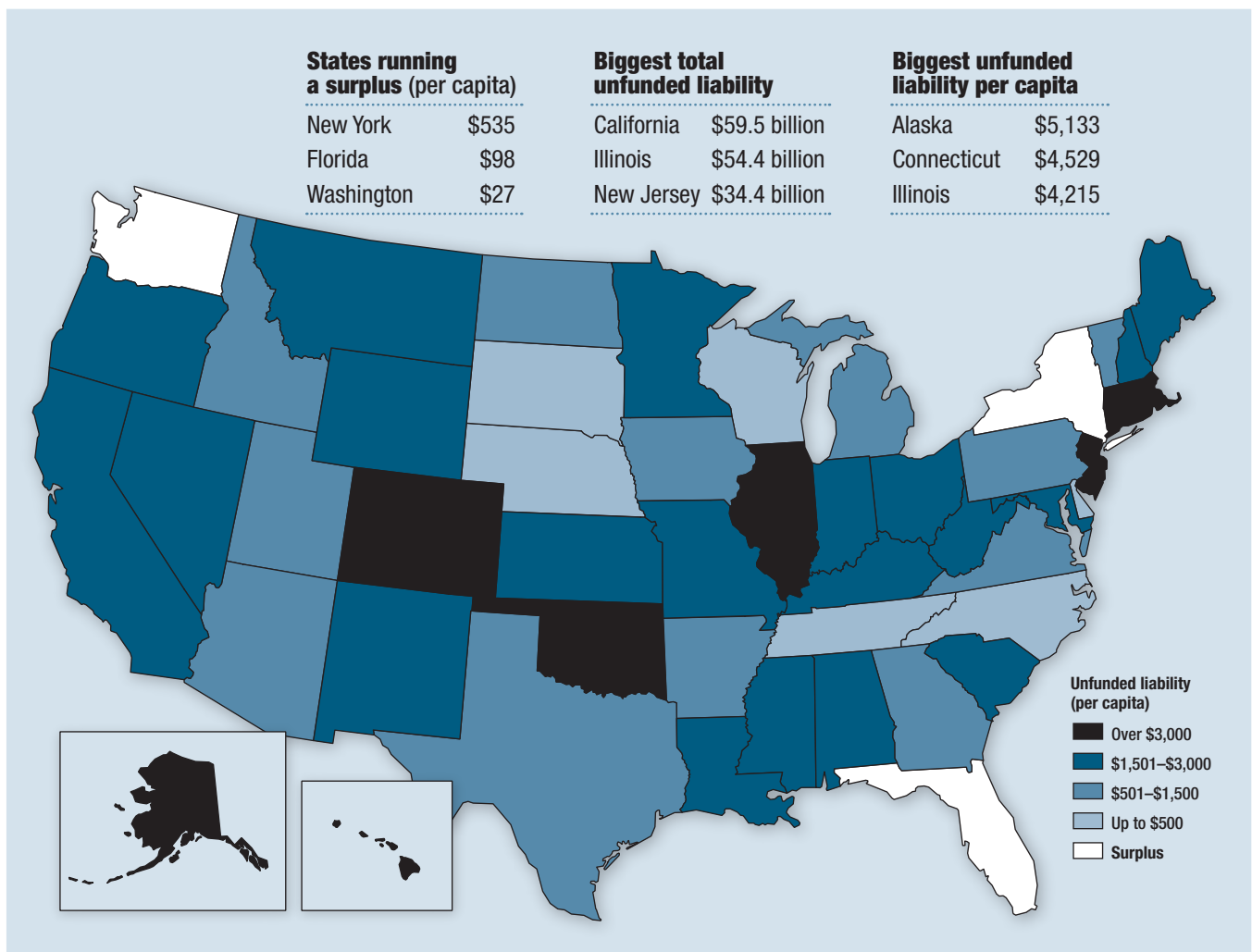
The national funding level totals, and even the state-level numbers, are often less helpful to consider than the figures on a per capita basis, because any deficit must be overcome by the state's taxpayers, and any

surplus is owed to them. Nationally the per capita unfunded liability amounts to almost \$1,500 for every man, woman, and child, but funding levels vary quite dramatically across state boundaries. (See Figure 4.) Three states—Washington, Florida, and New York—actually had surpluses, meaning they had more than enough saved to cover the accrued pension benefits of all current workers and retirees. The largest liability in total dollars is California at nearly \$60 billion, but on a per resident basis it falls to 26th. Alaska ranks worst in this category, as each person living in the state owes more than \$5,100 to current and future government worker retirees, compared to New York with a \$500 surplus per person.

Social Security offers additional context on the funding ratio figures because it too goes through

periods of over- and underfunding. Unlike state and local pension plans, Social Security collects the tax dollars of current workers, pays money out immediately as benefits for current retirees, and invests the surplus in Treasury bills. Tax rates are set by Congress to more or less meet the equilibrium, but, because rates are not adjusted annually, there are times of surplus and times of need. As of 2009, the Social Security trust fund had a surplus of \$2.2 trillion, but without policy changes, that figure is expected to begin falling in 2016 and be completely exhausted by 2039.¹⁴ This pay-as-you-go model was used by state and local pension plans until most transitioned in the 1970s and '80s to the current model of keeping a reserve fund to meet future obligations. Massachusetts, for example, operated on a pay-as-

Figure 4. Forty-Seven States Have Unfunded Liabilities



Note: Authors' calculations from "The Trillion Dollar Gap," (Washington, D.C.: The Pew Center on the States, February 2010).

you-go basis until 1990 and has gradually increased its reserve fund holdings and improved its funding ratio over time.¹⁵

In fact, some degree of government pension plan underfunding may be acceptable. The GAO, for instance, in its semi-regular reports tracking state and local government pensions, measures the percentage of plans with a funding ratio of 80 percent or better. Moreover, an overfunded system would suggest the state had invested more money for future retirees than was actually needed. The surplus could have instead been spent on any other pressing budget area.

Pensions and the Teaching Work Force

For all their strengths, public-sector defined benefit retirement plans have a number of structural elements that negatively affect the teaching work force. Public pension benefits have been structured and enhanced over the last two decades to heavily favor teachers willing to stay in the profession for their entire career or those who are committed to staying in one state or district.

These incentive structures no longer match the profile of the teaching work force. In 1987–88, the

median teacher had 14 years of experience, and the mode of teacher experience, or the most common occurrence, was a teacher with 15 years on the job. By 2007–08, the median had dropped to 11, and the mode had plunged to one.¹⁶ (See Figure 5.) In other words, a teacher with only one year of experience is now more common than any other teacher/experience combination.

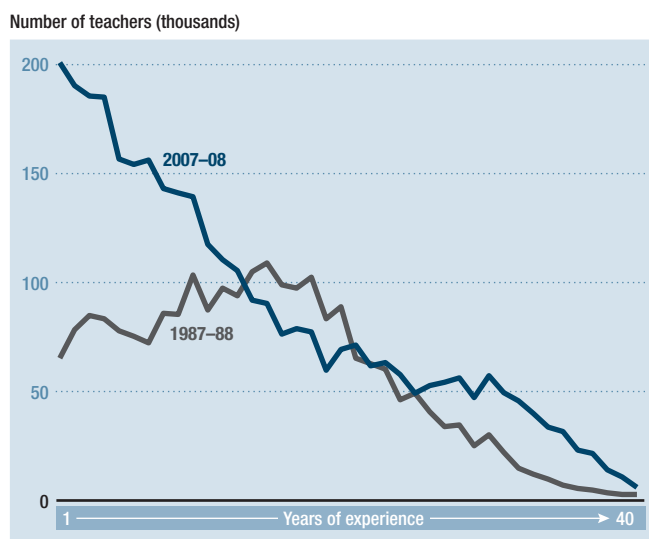
Defined benefit pension plans have always used years of experience as one component of the benefit formula. This makes sense: It's easy to measure, and it encourages a stable work force. A stable and experienced teaching force is also cost effective, since recruitment and training costs can be substantial.

But an additional year of teaching experience does not necessarily mean a teacher is more effective. Teaching effectiveness tends to increase rapidly in a teacher's first few years on the job, only to level off after a few years.¹⁷ In other words, the first years of experience are far more valuable than later ones, and teachers with a few years of experience are indistinguishable, in terms of effectiveness in the classroom, from teachers with many more years on the job.

Teacher pension plans, however, are structured as if those last years are the most productive. Plans mostly back-load benefits so that teachers accrue substantial pension wealth in their last years in the classroom. Factoring in annual salary and benefits, teachers earn their peak compensation about age 55, much later than their private-sector peers. Lawyers and doctors, for instance, reach their compensation peaks much earlier, in their early 40s. But for them, it's more like reaching a plateau, as their compensation stays more or less constant for the next 20 years.¹⁸ For teachers, their peak compensation is truly a peak, meaning they reach their maximum wages in their last years on the job as salary and benefits spike at the end of their career. Their most lucrative days are near their last.

Consider the pension wealth accrual of a teacher in the state of Missouri who begins teaching at age 25, but doesn't reach her peak compensation until age 53. (See Figure 6.) She is "vested" after five years of teaching, when she is 30, meaning she would be eligible to receive a retirement benefit at age 60. Benefits accrue linearly until she has put in 20 years,

Figure 5. Teachers Today Have Fewer Years of Experience



Source: Thomas G. Carroll and Elizabeth Foster, "Who Will Teach? Experience Matters," (Washington, D.C.: National Commission on Teaching and America's Future, January 2010).

at which time they start to increase much more rapidly. In Missouri, benefits peak when teachers hit the “rule of 80,” a common rule allowing employees to retire with full benefits when their experience and age sum to 80 years. This teacher passes this mark at age 53, when she has 28 years of experience (53 years old + 28 years of experience = 81 years). Pension wealth accruals fall steeply after that, other than a small bounce for a delayed retirement program. And for every year she works after age 56, pension wealth accruals are actually negative. Since she could retire with full employment benefits at this point, she would essentially be *losing* pension wealth for every year she continues to work. (This does not count “double-dipping,” whereby a retiree can start working again, in basically the same job, while also collecting a pension.)

The pension accruals in Figure 6 represent significant sums of money. For a teacher with a \$50,000 annual salary, her pension wealth increases by nearly \$100,000 at her peak. Missouri’s case is not atypical. Similar charts have been created for many other states.¹⁹

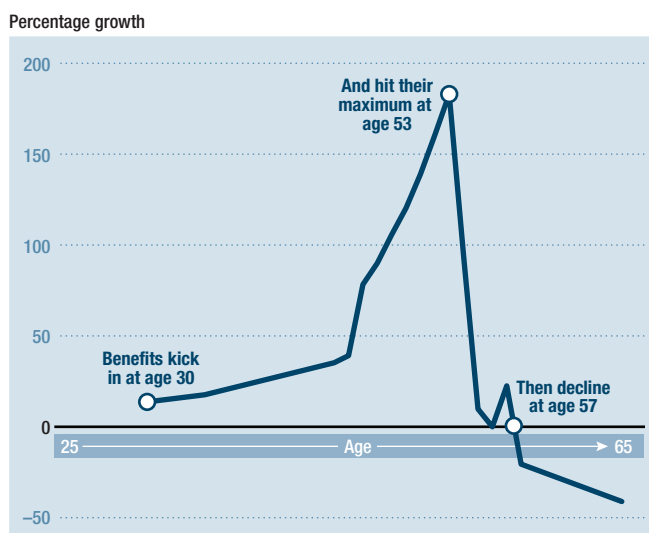
The large financial incentives in current retirement plans have negative implications for teachers and their students. If burned-out teachers are willing to

hang on just to earn a larger retirement package, they are doing a disservice to the children they teach. Or, if teachers are still passionate and effective past the point of the normal retirement age, they face large monetary penalties to stay in the classroom.

These extreme rewards and penalties do affect retirement behavior. When a new benefit enhancement for California teachers created a financial windfall for teachers with 30 years of experience who were exactly 61½ years old, the percentage of teachers retiring at the relatively odd age of 61½ doubled. Another component, allowing the multiplier factor to increase for teachers with 30 years or more of experience, meant that teachers suddenly became three times more likely to retire with 30.5 years of experience than with 29.5.²⁰ Not surprisingly, when looking at the percentage of teachers retiring according to the sum of their years of experience and age in Missouri, there’s a steep spike around the “rule of 80.” (See Figure 7.) Teachers appear to know their benefits and plan their retirement accordingly.

Excessive rewards for longevity might be justifiable if they applied to all teachers equally. Unfortunately, current public-sector defined benefit pension systems are heavily biased toward teachers with longevity *and* stability. Many state systems essentially punish

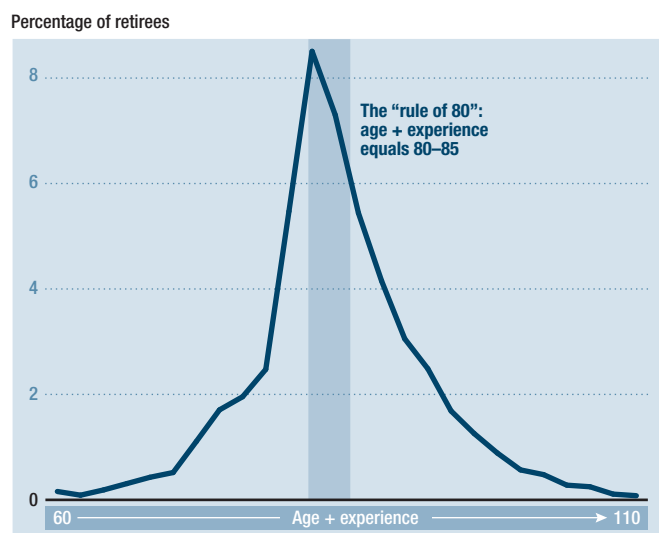
Figure 6. Incentives in Missouri Teachers’ Pension Accruals



Source: Robert M. Costrell and Michael Podgursky, “Peaks, Cliffs and Valleys: The Peculiar Incentives in Teacher Retirement Systems and their Consequences for School Staffing,” (Washington, D.C.: Urban Institute, November 2007).

Note: Assumes Jefferson City, MO, teacher salary schedule.

Figure 7. In Missouri, Retirement Age Corresponds to Pension Accruals



Source: Michael Podgursky and Mark Ehlert, “Teacher Pensions and Retirement Behavior,” (Washington, D.C.: National Center for Analysis of Longitudinal Data in Education Research, April 2007).

Note: Excludes St. Louis and Kansas City teachers.

As education leaders and policymakers struggle to identify highly effective teachers, increase their numbers, and distribute them equitably, outdated pension structures often stand in the way.

teachers who enter or exit the system prematurely. Such plans allow workers to cash out with a lump-sum payment if they exit before retirement age, but most often workers have to do so without their employer's contributions. More importantly, if workers opt not to take the lump-sum, the pension that arrives years later when they retire will be calculated based on their final average salary from many years before, unadjusted for inflation or salary increases. And, at the other end, plans allow entering workers to purchase years of experience credit, but they impose strict limits and require entering workers to cover the employer's share as well.

These mobility penalties can amount to hundreds of thousands of dollars in lost pension wealth. Using the benefit formula and base salary information from Missouri, researchers found that a teacher staying in one place for 30 years would accumulate twice the pension wealth than a peer teaching in two districts for 15 years each.²¹

Thus, depending on how salary schedules and retirement benefits are designed, they can either help or hinder efforts to recruit and retain effective teachers, a goal that has moved to the center of the policymaking and grant-making agendas today. Research clearly indicates that among *in-school* factors, teacher quality matters more to student learning *than anything else schools contribute*. In fact, research by economists Eric Hanushek and William Sanders suggests that the differences in effectiveness between highly effective and highly ineffective teachers are large enough over multiple years to substantially offset or possibly even overcome the

racial and economic gaps in student achievement that exist today.²²

As education leaders and policymakers struggle to identify highly effective teachers, increase their numbers, and distribute them equitably, outdated pension structures often stand in the way. In an Education Sector survey, nearly four out of five teachers agreed that, "too many veteran teachers who are burned out stay because they do not want to walk away from the benefits and service time they have accrued." About the same number indicated that making it easier to leave and return to teaching without losing retirement benefits would help attract and retain high-quality teachers to the teaching profession.²³

Although the demands on schools and the ways schools operate have changed dramatically over the past 40 years, public education's approach to human capital has changed little. Teachers are still mostly attracted, trained, evaluated, and compensated much as they were generations ago. As such, these processes are generally misaligned with today's efforts to improve the quality of classroom instruction. This is an enormous problem considering that 70 percent of the \$582 billion spent annually on American public education goes directly to supporting personnel.²⁴ No enterprise, public or private, can thrive over time without paying close attention to how it recruits, trains, and retains its very best people.

Pension reform cannot be expected to entirely solve our human capital problems. But given the link between compensation and human capital challenges, as well as the clear disincentives that exist today, it is essential that conversations on pension reform and improving teacher quality do not happen apart from each other.

The Fix

There are no simple tweaks to address public-sector pension plan underfunding, longevity, or mobility problems. Powerful political interests helped put existing public-sector DB plan elements in place over time, and equally powerful legal protections ensure their continuity. These make any changes to pension plans all the more difficult, but there are promising legal, political, technical, and structural strategies

states can pursue to better meet the needs of a modern teaching work force.

Managing Political Influences

Teachers, with 3.3 million active workers, or more than one out of every 50 working Americans, constitute the largest professional occupation in the country. It should come as no surprise, then, that teachers unions are one of the most powerful interest groups. The National Education Association, the nation's largest teachers union, was the single biggest donor to national and state political campaigns in 2008, and most of that money was directed to state candidates. More than 95 percent, \$53.6 million out of \$56.2 million, went to influence state campaigns.²⁵ As a result, teachers unions exert a strong influence over governors and legislators making pension decisions.

With such strong political advantages to gain, legislators often move to raise retirement benefits, particularly during years of financial boom. In so doing, they can point to something concrete that they have done for an influential constituency. Nationally, researchers have found that state legislatures made retirement plans about 10 percent more generous between 1982 and 2006.²⁶

Yet, because the costs of raising benefits are deferred until the teachers actually retire, the total bill won't come due for years. The legislators who vote for increasing retirement benefits are not the ones who have to figure out how to pay for them. This political disconnect leads to circumstances like one experienced in Missouri in the 1990s. From 1992 to 2002, the Legislature voted eight times to increase teacher retirement benefits, moves that collectively will cost the state \$193,000, in present dollars, for each teacher.²⁷

Some states, in an attempt to bind future legislators to meet previously determined contribution levels, have passed laws attempting to hold legislators accountable by requiring full contributions each year. Not surprisingly, these measures have not worked, because current legislators can always pass new laws to ignore the wishes of prior legislatures.

Georgia and Oklahoma, however, have found a way to combat the political urge to increase pension benefits during boom years, and other states could follow

With such strong political advantages to gain, legislators often move to raise retirement benefits, particularly during years of financial boom. In so doing, they can point to something concrete that they have done for an influential constituency.

their lead. These two states passed constitutional amendments requiring a lag time between a proposal to increase benefits and the vote on the proposal. Any law changing the benefit calculation must be proposed in one year, accompanied by a full report on the budgetary consequences of the decision, paired with full funding to pay for the changes, and cannot be voted on until the following year. This guarantees ample time for public discussion and a full accounting of the legislature's decisions. The constitutional nature of these provisions may be necessary to bind future legislatures.

Compared to annual salaries, pensions are a relatively small pot of money—teachers receive about 14 percent, on average, of their annual salary as employer paid contributions to their defined benefit retirement accounts—but their political value is substantial.²⁸ As such, pension reforms are either neglected in favor of other efforts or used as bargaining tools to attain larger policy goals. Denver leaders were able to put in place the controversial (at the time) ProComp merit pay program, which rewards teachers with up to \$2,403 a year for student achievement gains, but they left in place large back-end retirement benefits potentially worth hundreds of thousands of dollars to teachers.²⁹ Mayor Michael Bloomberg in New York City has traded increases in the city's teacher retirement plan contribution for a small merit pay program and for eliminating two days of teacher planning before school started in the fall.³⁰ Trades like these ignore the importance of pension reform.

Overcoming Legal Barriers

Many states have created powerful legal boundaries to protect workers from employers making arbitrary changes to pension plans. These protections, while important, are exceedingly rare in all other professions, and they serve as boundaries that will guide any prospective changes to state or municipal pension plans. States protect pensions in different ways, each of which has a distinct set of options for pension reform.³¹ Some of these barriers are quite onerous, limiting changes only to future employees, while others provide more flexibility.

New York and Illinois, for example, prohibit any reduction in benefits for current employees, even those benefits that are merely *potential*. Adopting a new benefit calculation would be impermissible if it resulted in a *single participant* receiving one *single*

dollar less than they would have received under the old formula, even if the benefits have yet to be earned. These restrictions can be removed only through changes to the state’s constitution.

Many states view public-sector retirement benefit formulas as a contract between an employer and an employee, but this still varies from state to state. A number of states use what’s called the “California rule,” whereby a contract is deemed to exist as of the date an employee is hired, and states can make changes to the contract only if any disadvantages caused by such changes are offset by comparable new advantages. Other states view public pension plans as contracts (often formed on the first day of employment, but this varies among states), but allow changes that are reasonable and necessary to serve an important public purpose. Judges in these

Table 1. Strengths and Weaknesses of Potential Pension Changes

Type of Fix	Potential Fix	Strength(s)	Weakness(es)
Technical	Raise Retirement Age	<ul style="list-style-type: none"> Politically symbolic Aligns teacher and non-teacher retirement age more closely 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers Does not address portability issues
	Extend average salary years	<ul style="list-style-type: none"> Reduces likelihood of salary spikes Lowers average salaries in benefit calculation 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers Does not address portability issues
	Change multiplier factor	<ul style="list-style-type: none"> Lowers benefit calculation 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers Does not address portability issues
	Restrict sick leave days counted	<ul style="list-style-type: none"> Reduces likelihood of teachers saving leave time 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers Does not address portability issues
	Lengthen vesting periods	<ul style="list-style-type: none"> Creates large financial incentives for teacher retention Rewards career teachers 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers Makes portability issues worse
Political	Construct political safeguards, such as mandating minimum annual payments	<ul style="list-style-type: none"> Encourages long-term thinking Establishes safety net against quick decisions 	<ul style="list-style-type: none"> Reduces future legislative power Inflexible during market swings
Structural	Adopt defined contribution plan	<ul style="list-style-type: none"> More predictable budgeting Solves portability problems 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers Individuals carry additional risks
	Adopt cash balance plan	<ul style="list-style-type: none"> More predictable budgeting Solves portability problems Easy to understand 	<ul style="list-style-type: none"> Requires legal changes to affect current or retired workers May produce lower investment returns

states have typically found a breach of contract in any reduction in benefits to individual members, and they've accepted only very minor changes or ones that include both additions and subtractions in benefits.

But the hands of state and local policymakers are not completely tied to existing legal limitations, and there are some measures of reason even in the strictest states. All states allow changes to things that affect pensions but aren't actually part of the benefit calculation. So even in places with strict constitutional protections like New York and Illinois, the state can reduce salary levels, terminate employment, or take other actions that would reduce an employee's pension, so long as they don't change the pension formula itself. To change the formula for existing employees, though, these states would have to amend their constitutions.

In states viewing pensions as a contract between employees and their employer, it may be possible to convince a court to change the way the contract is viewed. One possible argument would be that the contract should be viewed as an ongoing contract that protects benefits as they are earned, but does not protect future accruals that relate to service that has not yet been performed. This would protect the benefits already earned by workers, but in the case of future benefits, the approach would be more consistent with that taken in the private sector.

A handful of states use an approach that rejects contracts altogether. It is called the "property interest" or "due process of law" approach, and these states equate retirement expectations with a property right that can only be taken away with due process of law. In these states, changes to pension plans are allowable so long as they are not arbitrary or irrational. These states have been able to raise the retirement age, increase early withdrawal penalties, and change the definition of compensation as long as the changes are pursued out of a state interest and employees are given an appropriate warning beforehand.

Legislators particularly keen on making changes in states that protect pensions under a contract theory would first need to document a compelling need for the change (e.g., a fiscal crisis that makes continuing pension accruals at their current rates untenable), pass legislation making the desired changes, wait

for a legal challenge, and then defend the change. The process would be similar in a state that protects pensions as property interests, but the likelihood of surviving a legal challenge would be much higher.

States may be able to augment their case by drafting compromise measures that phase in changes over time. When lawmakers increased the normal retirement age for Social Security from 65 to 67, for example, they raised it gradually and over a long time horizon. Although the law passed in 1983, the actual changes did not take effect until 2000, and even then the normal retirement age increased only two months at a time. The final effect of the law, moving the normal retirement age to 67 for all workers, won't be in place until 2027. These transition periods gave workers nearing retirement an advance warning. Private-sector employers operating defined benefit plans can reduce benefits at any time so long as they give their employees 45 days of warning before the changes go into effect. States could take an approach somewhere between these two examples, and the courts may look kindly on a state that takes prudent steps to provide opportunities for workers to adapt their retirement plans.

In any case, states with strong legal protections can pursue only limited changes, and, for the most part, any changes in pension formulas (other than benefit enhancements) can affect only prospective employees, i.e., unless states change their constitutions or are able to convince a court that a contractual change is permissible. This makes transition costs an important part of any structural change. For example, if a state, in a desire to control costs, were to switch to a defined contribution plan, it could do so only for *incoming* teachers. While it set up the new plan and began enrolling members, the state would also have to maintain the current plan until the last teacher retired and eventually died. This could, alternatively, be seen as a positive. The state may have to operate two systems simultaneously, but it would not have to transition employees from one plan to the other. In the private sector, such transitions have been fraught with difficult questions about appropriate account balances and with provisions that reduce the employee's pension wealth. Individuals have often sued to redress these concerns, and much of federal pension law deals with these complex transition issues.

Temporary Technical Fixes

There are a number of minor financial tweaks that states have considered or adopted over the years to increase pension revenue or decrease pension payments. Some of these options, like restricting the number of sick and vacation days used in the benefit calculation, for example, should be seen as more symbolic than as large-scale financial measures. Other options, like raising the retirement age, would help to make public-sector retirements a little more like those of their private-sector peers, since private-sector employees are retiring at older ages than their public-sector counterparts. Still other options, such as lengthening the amount of time before a teacher becomes eligible to receive a pension, actually work against the human capital issues involved in recruiting, retaining, and distributing teacher talent. Most importantly, without legal challenges or changes to state constitutions, in many states all such changes could only affect future teachers.

These caveats in mind, the easiest fixes, technically, are ones that alter the benefit formula. One such option is expanding the number of years over which an employee's final average salary is calculated. Because salaries tend to rise with experience, changing the final average salary from one year's time to three, three to five, or five to 10 will generally reduce the benefit the employee can expect to receive. Many public-sector pensions are calculated off only a few years of wages at the end of the

Early retirements essentially shift the costs from districts, in the form of salaries, to states, in the form of pension payments. And, if the early retirement incentives are not allowed to relapse after the recession ends, they become the “new normal” that workers expect to receive.

worker's career, which encourages those workers to negotiate for steep increases at the end of their career. Social Security, as a comparison, uses 35 years of wages, adjusted for inflation, to calculate benefits.

Pairing early retirement incentives with a hiring freeze, particularly during recessions, is another way to reduce expenditures, at least temporarily. This works as a short-term cost-saver because the pension payments are smaller than salaries, especially for the affected late-career workers who typically command higher-than-average salaries. The savings are only temporary, however, because once the hiring freeze ends, the employer will replace the salary of one late-career employee with a pension for the retired employee in addition to the salary of the replacement. Early retirements essentially shift the costs from districts, in the form of salaries, to states, in the form of pension payments. And, if the early retirement incentives are not allowed to relapse after the recession ends, they become the “new normal” that workers expect to receive. To address the full extent of financial and human capital problems in public-sector pensions, state and local governments must think seriously about more lasting reform.

Changing the Structure

Lasting pension reform is most likely to come in the form of changes to the way plans are structured. An appealing and often-cited idea is to shift to a system that looks more like the defined contribution plans that private-sector workers have from their employers. As a long-term solution, it would solve much of the budgeting and underfunding problems states and localities currently face. Contributions each year are much more predictable. Employers would be able to predict their pension contributions each year based on salaries and contribution formulas that had been previously determined, without worrying about that year's market returns.

Such a move could also do a great deal to solve the human capital and portability issues. School districts could use matching contributions and other incentives as tools to enhance recruitment and retention. And, after a short vesting period, employees would own their own accounts and could take them with them whether they left their specific position

or the profession altogether. This would better align education benefits with the nature of teaching today—increased mobility between geography and careers.

Perhaps most importantly, DC plans would not have the same perverse push and pull evident in most DB plans. Teachers could let circumstances determine the right time to change jobs or retire. Retirement decisions would no longer be based on pre-determined formulas or heavily influenced by “benefit lock,” the point where it becomes economically untenable for educators to leave a job even if they wanted to. Instead, such a system would allow educators to factor their own interest into decisions to continue working, change jobs, or retire. There would no longer be specific rewards that accumulate at set points in time, pulling teachers to stay to just that point and pushing them out after.

Teachers would also own their own accounts, meaning they would be free to invest as much or as little as they choose. This would allow teachers dying before retirement age or early in their retirement to transfer their savings to their heirs directly, instead of designating benefits for their survivors.

For all the promises of DC plans, they do have one major weakness: They place the burden of saving for retirement on workers. The experience with 401k plans in the private sector is mixed. Some workers choose not to participate, and by doing so forgo free money if their employer is offering matching contributions. Individuals also tend to make poor choices with the money they do invest. They leave it in too-safe investments; they don’t adjust their investments for their age (younger workers can afford to take more risk, while workers nearing retirement should be more conservative); or they park all their savings in company stock. When they change jobs, they cash out their savings rather than keeping it as money for retirement.³² Most fundamentally, employees just don’t save enough. A 2007 GAO report found that, among workers aged 55-64 with a current or former DC plan, the median account balance was \$50,000, a sum that would convert to an annual benefit beginning at age 65 of just \$4,400.³³

Part of the problem with DC plans is that they’re still too new to evaluate their long-term effect on retirement decisions. Companies began transitioning from DB to DC plans as their exclusive retirement

Perhaps most importantly, DC plans would not have the same perverse push and pull evident in most DB plans. Teachers could let circumstances determine the right time to change jobs or retire.

offering in the 1980s and ‘90s, and only now are workers who made this transition nearing retirement. As these workers begin to retire, we’ll know more about long-term effects, but any adverse influences on a large and solidly middle-class profession like teachers could have ripple effects throughout the country.

An alternative retirement structure to defined benefit and defined contribution systems is a cash balance plan. Each year, a CB plan awards employees with a salary credit (some percentage of their salary) and, on the balance already accumulated, an investment return credit (some fixed or indexed rate of return). The employer’s contributions are set at the fixed percentage of salary, and the return credit is fixed either at some relatively safe percentage (for instance 5 percent) or indexed to an external figure like long-term Treasury notes. Technically, the employer owns the plans and has the responsibility (or the benefit) of any investment return deficit (or surplus). But when workers are ready to retire, they can take their entire balance as a lump-sum payment or convert it to an annuity that would guarantee them monthly payments for life.

Legally, CB plans are considered DB plans, but they have key differences that address many of the weaknesses of both DB and DC plans. CB accounts are portable and would not disadvantage mobile workers or create as many perverse incentives. They would not encourage a teacher to retire in any particular year. They would be required to cover all workers for at least a certain minimum retirement savings, but they would not require workers to

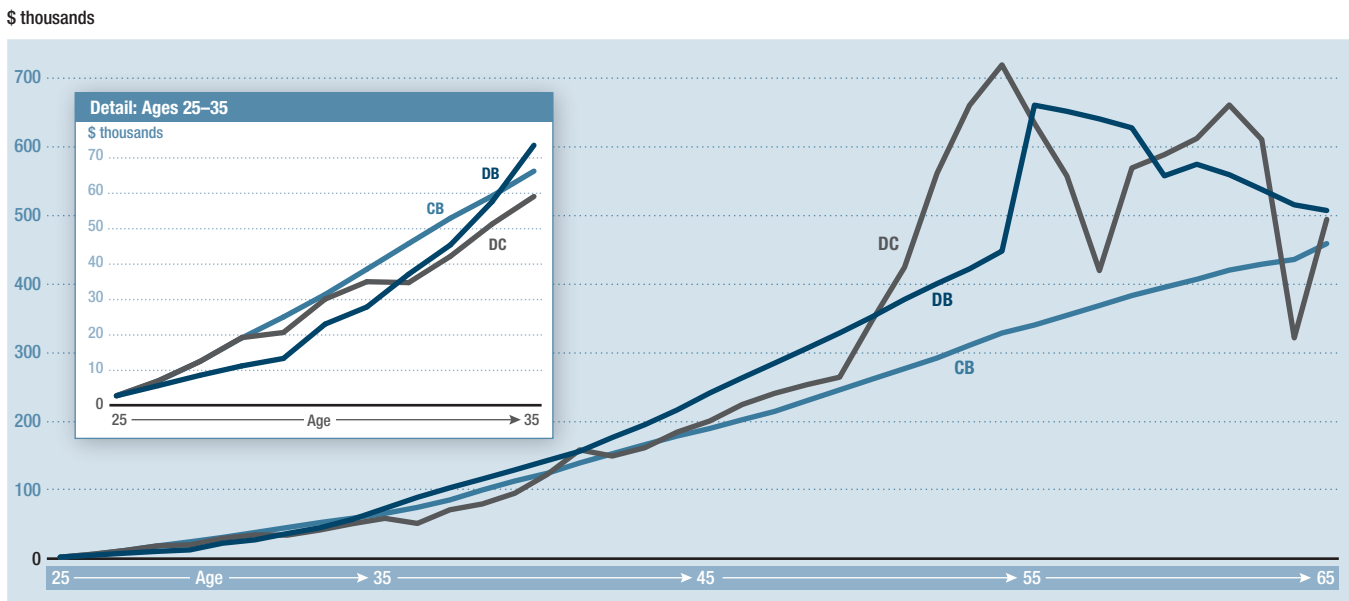
manage their own investments. And, because CB plans are typically invested in low-risk bonds and other conservative investments, there would not be the same underfunding issues that occur in current DB plans. The primary weakness in CB plans is that the guaranteed rate of return is typically lower than that earned in either DB or DC plans. In essence, CB plans trade security and predictability for lower returns.

Figure 8 shows what workers could expect from each of these three plans. It graphs total pension wealth by age and type of pension, with assumptions built in around existing plan features. The assumptions are taken from 57 large state and local pension systems that were specifically selected for their inclusion of teachers.³⁴ The figures are in constant 2010 dollars and are retrospective for a hypothetical teacher beginning her career at age 25 in 1970. They assume an annual salary of \$50,000 (in reality the teacher could expect salary increases with added experience). Figure 8 shows what each plan structure would look

like for teachers staying in the profession for a short period of time (10 years) as well as over a 40-year career.

Each plan has distinctive trade-offs.³⁵ For the defined benefit plan, the teacher would have only her own contributions until vesting with five years of experience. Figure 8 shows that if she left the profession with fewer than 10 years of experience, she would lose out with a DB plan. Figure 8 also shows that a teacher with a DB plan would see her pension rise to a peak after 30 years of experience, (the median service requirement for normal retirement in the 57 plans). She is 55 years old. At this point, assuming a life expectancy of 78 years, her pension would be worth \$660,000. She does not own this money, but is guaranteed annual payments totaling \$30,000, plus annual cost-of-living adjustments. For simplicity's sake, this hypothetical assumes she takes her maximum monthly benefit and does not leave any benefits for her survivors.³⁶ If she lives long into retirement, she will continue to receive her guaranteed

Figure 8. Comparing Three Different Pension Plan Structures



Note: Authors' calculations: All three use a \$50,000 base salary and the observed U.S. inflation rate from 1970 to 2010. CB plan assumes an investment return credit based on the 10-year Treasury bond rate from 1970 to 2010, 5.68 percent employee contribution in all years, and 7.49 percent employer contribution rate phased in over the employee's first three years. DC plan uses last 40 years of annual market returns on the S&P 500 (March 2, 1970 to March 1, 2010), 5.68 percent employee contribution in all years, and 7.49 percent employer contribution rate phased in over three years. Workers could choose to invest in more conservative assets (or a mix of aggressive and conservative), but this chart assumes they invest all of their retirement savings in a mutual fund tracking the S&P 500. DB plan assumes a five-year vesting requirement (if they leave before vesting, they get only their own contributions back, compounded at 5 percent interest, minus inflation), a 2 percent multiplier, normal retirement age of 62, and 30-year service requirement for early retirement. The contribution assumptions for all three plans and the age and vesting requirements in the DB plan are the median values used by 57 state and district pension plans that include teachers.

It's important to note that while the defined contribution and the cash balance plans represent fiscally neutral options, i.e., they would cost teachers and taxpayers the same amount as they do now, the defined benefit plan relies on current assumptions about investment returns and employee and employer contributions that may not accurately reflect the true long-term cost to taxpayers. For instance, if the stock market under-performs state estimates, taxpayers would have to make up the difference between the estimates and the actual rate of return, which could be substantial.

Table 2. Frequently Asked Questions About Different Pension Structures

Question	DB plan	DC plan	CB plan
Who bears the risk of investment returns?	Plan Sponsor	Employee	Plan Sponsor
Who is responsible for making sure contributions are sufficient?	Plan Sponsor	Employee	Employee/ Plan Sponsor
Who bears the risk of the employee living longer than expected?	Plan Sponsor	Employee*	Employee*
Who bears the risk of inflation devaluing the benefits?	Plan Sponsor	Employee	Employee
Are employer contributions predictable?	No	Yes	Yes
Who bears the risk of the employee becoming disabled?	Plan Sponsor	Employee	Plan Sponsor
Are employees automatically enrolled?	Yes	No	Yes
Are accounts portable across employers?	No**	Yes	Yes
Are account balances transferrable to unmarried survivors?	No	Yes	Yes

*Employees could choose to purchase annuities with their savings at the time of retirement, which would provide regular payments until death.

**Although states and districts vary, most impose severe penalties on workers who exit the system before retirement.

figure for the remainder of her life. Keep in mind, the defined benefit plan exhibits a true peak after this teacher has worked 30 years. If she works fewer years, she can expect a smaller benefit. If she works more years, her pension wealth diminishes, because every year she continues working is a year she cannot receive pension benefits.

Compare these results to the defined contribution plan. Each year, the employee and employer combine to set aside 13.17 percent of the employee’s salary after a three-year phase-in period of the employer contributions (the median figure of the 57 large DB plans). The money is invested directly in a mutual fund tracking the Dow Jones Industrial Average (the graph uses the annual returns from March 2, 1970, to March 1, 2010). As the market rises and falls, so does the worker’s retirement savings account, at times to great effect. For a teacher beginning her career in 1970 at the age of 25, her DC account balance would have peaked in 2000, at the end of the Internet boom, at \$719,000. At the age of 65, after a tumultuous decade for the stock market, the value would be down to \$494,000. A teacher with this type of benefit plan

would need to retire when the market is at a peak in order to maximize her retirement savings. And since DC accounts are owned by workers, if they die early in retirement, the balance of the account, after taxes, can be passed on to their heirs. Alternatively, if they live long into retirement, they bear the burden of making their finances last.

In contrast to each of these two traditional plans is the cash balance plan. After a three-year phase-in period for employer contributions, employees receive a 13.17 percent salary credit, including their own contribution of 5.68 percent, and an investment return credit equal to the rate of return on 10-year Treasury notes. These figures are guaranteed for the duration of the employee’s tenure. A teacher beginning her career in 1970 with a CB plan would have seen her retirement account rise steadily over her career and reach \$459,000 when she turned 65. The downside of the CB plan, however, is obvious: With a real rate of return of only 2.75 percent, after 4.5 percent inflation over the last 40 years, it is the least aggressive and lowest-performing, albeit steadiest, option.

Guideposts for Pension Reform

There is no easy way out of today's pension problems. All the options to fix the problems are substantially challenging, politically difficult, or both. Yet each year of inaction is a year the problem gets worse. Following are six guideposts for policymakers as they work to modernize today's pension systems.

1. Acknowledge that there is a problem. The first step to addressing this problem is to acknowledge that it exists. Elected leaders and policymakers as well as teachers unions and teachers associations all have incentives to play down the extent of this problem. Some elected officials do not want to be accountable for bad decisions made in the past. Teachers unions and teachers associations realize that reform may change some of the vested privileges and power that they enjoy under the current system. And, their most active members are generally winners under the current system. All stakeholders, especially the future beneficiaries of public retirement systems, deserve an honest accounting of the scale of this problem.

2. Craft policy solutions with an eye toward public finance realities and education's human capital problem. There are technical fixes and structural changes that policymakers could take to ease problems today and in the future. But solutions to the fiscal side of the equation that do not also take into account the education policy issues will further entrench today's human capital problems. Education policy experts and public finance, pension, and income security experts should all be at the table when policymakers are crafting solutions.

3. Think about the profession differently. Today's pension schemes are built around a profession that practitioners remain in for 20-30 years with an expectation that performance and value continue to improve over time. But gains in teacher effectiveness are heavily concentrated in the early years.³⁷ And younger workers, including teachers, are much more likely to move between careers. Solutions to the pension problem should be designed with an eye toward how the profession will look in the future, not how it looked in the past.

In particular, rather than back-loading benefits, policymakers should consider ways to smooth the

accumulation of benefits or even front-load them to help attract people to the profession. Major points of benefit accumulation could also be linked to key points in an educator's career. For instance, the point at which a teacher earns tenure could be a higher and more demanding bar than it is today and include an accompanying financial recognition for the accomplishment. Some of the resources that are currently used to back-load benefits could be repurposed as recruitment and retention tools for educators in the future.

Any changes will create winners and losers, but this ignores the extent to which the current system creates winners and losers already.

Any changes will create winners and losers, but this ignores the extent to which the current system creates winners and losers already, especially teachers who do not teach for an entire career or who move even once during their careers.

4. Hold harmless the benefits of current retirees and the benefits accrued to date of current teachers. Not only is honoring public commitments the right thing to do (and legally required in many cases), it's the politically smart thing as well. Teachers unions and teachers associations are disproportionately driven by the wishes of their older members. Thus, as much as possible, policymakers should seek to make these educators allies in reform rather than opponents. But ensuring that current educators are as minimally affected as possible should not preclude flexible and creative solutions to modernize the system.

To help ease any transition, states and districts pursuing reforms should consider transition periods, allowing any changes to take effect slowly and give workers the option to plan accordingly. The federal government requires private-sector employers to give 45 days warning to workers when cutting retirement contributions; states should consider longer transition

periods of one to three years. In addition, reforms and fixes need not mean abandoning the goal of ensuring that educators have comfortable, dignified retirements. There are strategies that can both guarantee a more sustainable retirement system but also help educators save and plan for their own retirements.

5. Seek changes that would make laws concerning pension system modifications more feasible.

States and districts can change salary levels or fringe benefits and can terminate employees pursuant to collective bargaining agreements—all things that affect pension calculations. But in many places they are legally forbidden from altering the prospective retirement benefits to employees who have been working for as little as one day. States can pursue legal efforts that would allow for greater flexibility. The federal government, for example, protects all pensions earned, but does not protect theoretical obligations.

6. Pursue political reforms. Enhancements to government pension plans are often political carrots that legislators can offer to important constituents,

but such decisions are often made without full consideration of their long-term fiscal impacts. States should follow the lead of Oklahoma and Georgia, which have recognized this pressure and enacted political reforms that will slow down and improve their decision-making process.

7. Increase transparency and analytic ability. States should incorporate pension data into state education data systems by linking pension information with personnel records and student achievement data to allow for richer analysis. States currently keep data about teacher retirement systems separate from other sources of information. But it would ensure greater transparency and provide additional sources of information if teacher retirement information was paired with data about student achievement, administrative records, and other sources of information that are commonly stored in state longitudinal databases. As with all data, the privacy of teachers and students must be respected, but such data are essential to a better understanding of trends and challenges in a state's education work force.

Appendix: Per Person State Pension Plan Liabilities

State	Unfunded Liability* (\$)	Funded Ratio* (%)	Population	Unfunded Liability Per Capita (\$)**
Alabama	9,228,918,000	77	4,661,900	1,980
Alaska	3,522,661,000	76	686,293	5,133
Arizona	7,871,120,000	80	6,500,180	1,211
Arkansas	2,752,546,000	87	2,855,390	964
California	59,492,498,000	87	36,756,666	1,619
Colorado	16,813,048,000	70	4,939,456	3,404
Connecticut	15,858,500,000	62	3,501,252	4,529
Delaware	129,359,000	98	873,092	148
Florida	-1,798,789,000	101	18,328,340	-98
Georgia	6,384,903,000	92	9,685,744	659
Hawaii	5,168,108,000	69	1,288,198	4,012
Idaho	772,200,000	93	1,523,816	507
Illinois	54,383,939,000	54	12,901,563	4,215
Indiana	9,825,830,000	72	6,376,792	1,541
Iowa	2,694,794,000	89	3,002,555	898
Kansas	8,279,168,000	59	2,802,134	2,955
Kentucky	12,328,429,000	64	4,269,245	2,888
Louisiana	11,658,734,000	70	4,410,796	2,643
Maine	2,782,173,000	80	1,316,456	2,113
Maryland	10,926,099,000	78	5,633,597	1,939
Massachusetts	21,759,452,000	63	6,497,967	3,349
Michigan	11,541,600,000	84	10,003,422	1,154
Minnesota	10,771,507,000	81	5,220,393	2,063
Mississippi	7,971,277,000	73	2,938,618	2,713
Missouri	9,025,293,000	83	5,911,605	1,527
Montana	1,549,503,000	84	967,440	1,602
Nebraska	754,748,000	92	1,783,432	423
Nevada	7,281,752,000	76	2,600,167	2,800
New Hampshire	2,522,175,000	68	1,315,809	1,917
New Jersey	34,434,055,000	73	8,682,661	3,966
New Mexico	4,519,887,000	83	1,984,356	2,278
New York	-10,428,000,000	107	19,490,297	-535
North Carolina	504,760,000	99	9,222,414	55
North Dakota	546,500,000	87	641,481	852
Ohio	19,502,065,000	87	11,485,910	1,698
Oklahoma	13,172,407,000	61	3,642,361	3,616
Oregon	10,739,000,000	80	3,790,060	2,833
Pennsylvania	13,724,480,000	87	12,448,279	1,103

State	Unfunded Liability* (\$)	Funded Ratio* (%)	Population	Unfunded Liability Per Capita (\$) **
Rhode Island	4,353,892,000	61	1,050,788	4,143
South Carolina	12,052,684,000	70	4,479,800	2,690
South Dakota	182,870,000	97	804,194	227
Tennessee	1,602,802,000	95	6,214,888	258
Texas	13,781,228,000	91	24,326,974	566
Utah	3,611,399,000	84	2,736,424	1,320
Vermont	461,551,000	88	621,270	743
Virginia	10,723,000,000	84	7,769,089	1,380
Washington	-179,100,000	100	6,549,224	-27
West Virginia	4,968,709,000	64	1,814,468	2,738
Wisconsin	252,600,000	100	5,627,967	45
Wyoming	1,444,353,000	79	532,668	2,712
Total	452,222,687,000		302,935,223	1,489

*From "The Trillion Dollar Gap: Underfunded State Retirement Systems and the Roads to Reform" Pew Center on the States, February 2010 (2008 figures).

** Authors' calculations from "The Trillion Dollar Gap."

Notes

1. These figures can be found at <http://www.psers.state.pa.us/Publications/cafr/index.htm>.
2. Retired teachers also have access to full health care benefits. When these costs are included, all states have unfunded liabilities, and they amount to \$1 trillion in the aggregate. *The Trillion Dollar Gap: Underfunded State Retirement Systems and the Roads to Reform* (Washington, DC: Pew Center on the States, February 2010) available at http://downloads.pewcenteronthestates.org/The_Trillion_Dollar_Gap_final.pdf
3. See, for example, Mary Williams Walsh, "In Budget Crisis, States Take Aim at Pension Costs," *The New York Times*, June 19, 2010, or Jeannette Neumann, "Pension Cuts Face Test in Colorado, Minnesota," *The Wall Street Journal*, June 12, 2010.
4. Figures for 1985 come from <http://www.bls.gov/opub/cwc/cm20030325tb01.htm>. For 2009 data, see <http://www.bls.gov/ncs/ebs/benefits/2009/ownership/private/table02a.pdf>
5. See <http://www.bls.gov/ncs/ebs/benefits/2009/ownership/govt/table02a.pdf>
6. Author's calculations from <http://www.census.gov/govs/retire/>
7. *The Trillion Dollar Gap: Underfunded State Retirement Systems and the Roads to Reform*
8. Thomas G. Carroll and Elizabeth Foster, "Learning Teams: Creating What's Next," (Washington, DC National Commission on Teaching and America's Future, April 2008).
9. U.S. Census Bureau's 2010 Statistical Abstract, Table 104. Available online at: <http://www.census.gov/compendia/statab/2010/tables/10s0104.pdf>
10. The mean retirement age for all American workers in 2000 was 62.6 years old. See: <http://www.bls.gov/opub/mlr/2008/01/art3full.pdf>. The mean retirement age for teachers in the same year was 58. See: <http://nces.ed.gov/pubs2005/2005114.pdf>
11. See Alicia H. Munnell, Robert K. Triest, and Natalia A. Jivan, *How Do Pensions Affect Expected and Actual Retirement Ages* (Chestnut Hill, MA: Center for Retirement Research at Boston College: 2004) and Leora Friedberg and Anthony Webb, "Retirement and the Evolution of Pension Structure," *Journal of Human Resources* 40, no. 2 (Spring 2005): 281–308.
12. See, for example, page 20 at <http://www.dol.gov/ebsa/pdf/privatepensionplanbulletinhistoricaltables.pdf>.
13. See "Public Fund Survey." 2009. Available at <http://publicfundsurvey.org>.
14. See <http://www.ssa.gov/OACT/TRSUM/index.html>.
15. James R. Lamenzo, "Comments on Session II: Fiscal Sustainability of Retiree Benefit Systems," (paper presented at the conference, *Rethinking Teacher Retirement Benefit Systems*, Nashville, TN, February 19–20, 2009).
16. Thomas G. Carroll and Elizabeth Foster, *Who Will Teach? Experience Matters* (Washington, DC: National Commission on Teaching and America's Future, January 2010).
17. See, for example, Robert Gordon, Thomas J. Kane, and Douglas O. Staiger, "Identifying Effective Teachers Using Performance on the Job," The Hamilton Project (Washington, DC: Brookings Institution, April 2006).
18. See, for example, Jacob Vigdor, "Scrap the Sacrosanct Salary Schedule," *Education Next* 8, no. 4 (Fall 2008).
19. See, for example, charts from Arkansas, Ohio, Massachusetts, Texas, and California from Robert Costrell and Michael Podgursky, "Peaks, Cliffs, and Valleys: The Peculiar Incentives in Teacher Retirement Systems and Their Consequences for School Staffing," *Education Finance and Policy* 4, no. 2 (Spring 2009): 175–211.
20. Kristine Brown, "The Link Between Pensions and Retirement Timing: Lessons from California Teachers," (paper presented at the conference, *Rethinking Teacher Retirement Benefit Systems*, Nashville, TN, February 19–20, 2009).
21. Robert M. Costrell and Michael Podgursky, "Golden Handcuffs," *Education Next* 10, no. 1 (Winter 2010).
22. See, for instance, William L. Sanders and June C. Rivers, *Cumulative and Residual Effects of Teachers on Future Student Academic Achievement* (Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center, 1996); Steven G. Rivkin, Eric A. Hanushek, and John F. Kain, "Teachers, Schools and Academic Achievement," *Econometrica* 73, No. 2 (March, 2005): 417–458.
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26. Robert L. Clark and Lee A. Craig, "Determinants of the Generosity of Pension Plans for Public School Teachers, 1982–2006," (paper presented at the conference, *Rethinking Teacher Retirement Benefit Systems*, Nashville, TN, February 19–20, 2009).
27. Shawn Ni, Michael Podgursky, and Mark Ehlert, "Teacher Pension Incentives and Labor Market Behavior: Evidence from Missouri Administrative Teacher Data," (paper presented at the conference, *Rethinking Teacher Retirement Benefit Systems*, Nashville, TN, February 19–20, 2009).
28. This figure comes from the Public Fund Survey, a compendium of data on 85 percent of the state and local government retirement systems, from October 2009. It includes only teachers who also pay into Social Security. About one-third of public school teachers are exempt from Social Security; their total contribution rates average 19.9 percent of their salary.
29. "Attracting and Retaining The Most Effective Teachers to Work in the Denver Public Schools," PowerPoint presentation obtained by the authors from Achieve, an independent, bipartisan, nonprofit education reform organization based in Washington, D.C.
30. See, for example, Philissa Cramer, "School to Start Sept. 9, not Sept. 8, after principal protest," *GothamSchools.org*, June 25, 2009, or Sewell Chan, "Mayor Announces Plan for Merit Pay," City Room blog for the *New York Times*, October 17, 2007, available online at: <http://cityroom.blogs.nytimes.com/2007/10/17/mayor-announces-plan-for-teacher-merit-pay/>.

31. For a complete discussion of the legal issues surrounding pension reform, see Amy B. Monahan, "Public Pension Plan Reform: The Legal Framework," Education, Finance & Policy 5 (forthcoming). Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1573864, or National Conference on Public Employee Retirement Systems, "State Constitutional Protections for Public Sector Retirement Benefits," March 2007: Available at <http://www.ncpers.org/Files/News/03152007RetireBenefitProtections.pdf>.
32. According to the GAO, of workers who received a lump sum payment from changing jobs or switching from a DB to a DC plan, nearly 47 percent cashed out all the funds for immediate use, another 4 percent cashed out some money, and only half rolled the money into another retirement savings account. *Private Pensions: Low Defined Contribution Plan Savings May Pose Challenges to Retirement Security, Especially for Many Low-Income Workers*, (Washington, DC: U.S. Government Accountability Office, 2007).
33. *Private Pensions: Low Defined Contribution Plan Savings May Pose Challenges to Retirement Security, Especially for Many Low-Income Workers*.
34. These 57 plans come from Janet S. Hansen, "Teacher Pensions: A Background Paper," (Washington, DC: Committee for Economic Development, May 2008.).
35. The discussion in this paper is limited to the effects on individual workers. The consequences of shifting trillions of dollars from government-managed DB plans to Treasury bills, as in cash balance plans, or the open stock market, as is likely to happen with defined contribution plans, are unknown.
36. She has several options about how to structure her benefits to leave money for survivors so that she may weigh her and her spouse's age, health, and financial situations and choose the best option. All the choices involve trade-offs, so she could choose to reduce her own monthly retirements benefit so that, when she passes away, her husband would be entitled to a pro-rated share. Or, as is commonly done, she might choose to set aside some small pre-defined lump sum payment upon death that will cover her funeral expenses.
37. See, for instance, William L. Sanders and June C. Rivers, "Cumulative and Residual Effects of Teachers on Future Student Academic Achievement" or Steven G. Rivkin, Eric A. Hanushek, and John F. Kain, "Teachers, Schools and Academic Achievement."

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