

analysis

Reforming Nevada's Public Employees Pension Plan

by Andrew G. Biggs

Executive Summary

The Public Employees' Retirement System of Nevada provides retirement, survivors and disability benefits for Nevada state and local government employees. It is currently one of the better-funded public-sector pensions, due to sound management and consistent government contributions.

However, the true funding health of Nevada PERS is far poorer than most realize, due to accounting standards that are far more lax than those required for private-sector plans. Using fair-market valuation, which is endorsed by the vast majority of professional economists, is used by financial markets to value liabilities and which is required of private-sector plans, Nevada PERS' funding ratio falls from 70 percent to around 34 percent and its unfunded liabilities would rise from about \$10 billion to almost \$41 billion.

Annual contributions to cover accruing pension costs and amortization of unfunded

liabilities would rise from \$1.6 billion to an estimated \$5.8 billion.

As alarming as these figures may be, they are the figures that economists and financial markets believe are the most revealing of the true financial health of the Nevada pension program.

Shifting PERS to a defined-contribution, 401(k)-type structure would not make these unfunded liabilities go away. However, it would ensure that benefit obligations are fully funded going forward, ensuring that lawmakers, taxpayers and public employees are clear regarding the pensions promises the government has made and its ability to fulfill them.

While a defined-contribution (DC) approach is not perfect, experience with reformed 401(k) plans and the Thrift Savings Plan for federal government employees shows that a DC pension plan can be managed cost-effectively for employees and taxpayers alike.



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Introduction and Background on Nevada PERS

The Public Employees' Retirement System of Nevada (Nevada PERS or simply PERS) was established in 1947 to provide retirement, survivors and disability benefits to employees of the Nevada state government, with distinct plans for regular employees, police and fire, and judicial branch employees. In addition, city, county and other local government employees also take part in PERS, taking advantage of the economies of scale of a single statewide program. PERS has over 100,000 active members and over 40,000 beneficiaries, and currently holds assets with a market value of nearly \$21 billion. PERS is overseen by a seven-member board and is run day-to-day by its executive director and her staff, who oversee the operations of the program and interact with the investment professionals who conduct asset management and the actuaries who measure the plan's financial health.

Contribution and Benefit Rates

Contributions to PERS are split evenly between employers and employees. The total contribution rate for regular employees is 23.75 percent of salaries, while for police and firefighters it is 39.75 percent of pay.

In general, employees become vested in their benefits after five years of employment. Unreduced retirement benefits can be collected as of age 65 for employees with five years of service, as of age 60 for employees with 10 years of service, and at any age for employees with 30 or more years of service. For retirees not meeting these conditions, benefits are reduced by 4 percent for each year of early retirement. This reduction is considered to be actuarially favorable to employees, as the reduction does not fully account for the increased years of benefits they receive by claiming early. Social Security, for instance, reduces benefits by around 6.7 percent for each year of early retirement, an amount that is generally considered to be actuarially fair. The PERS early-retirement formula is, therefore, likely to encourage early retirement, as employees are not fully rewarded for additional years of work.

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The basic benefit formula for regular employees is 2.5 percent of final earnings multiplied by the number of years of service. The replacement factor is increased to 2.67 percent for service taking place after 2001. Final earnings are defined as the highest-earning consecutive 36 months of employment. Thus, for instance, an individual retiring after 25 years of service would receive a benefit equal to about 62.5 percent of his final pay. This basic benefit does not include a survivor benefit; however, retirees can accept a lower initial benefit in return for a survivor payment that continues after their death.

PERS members do not participate in Social Security, although they may be eligible to receive Social Security benefits based on other employment or based on their spouse's earnings. However, Social Security benefits may be reduced based upon amounts received from PERS due to the Government Pension Offset (GPO) and the Windfall Elimination Provision (WEP).

PERS Investments

PERS, like most other public-pension systems, holds an investment portfolio with a wide range of assets. The PERS portfolio is made up of roughly 40 percent domestic equities, 15 percent foreign equities, 30 percent domestic bonds, 5 percent international bonds and 10 percent private markets, composed principally of private equity and real estate. This also is roughly comparable with other pension plans, although a 2011 paper by this author evaluating the risk level of the target investment portfolio of 30 large public pensions found

that PERS ranked 26th, meaning it takes somewhat less investment risk than the typical public-pension plan.¹

Today ... a plan must take significantly more risk to generate the same nominal return as in the past.

PERS reports that, over the last 26 years, its investment returns have exceeded the 8 percent rate it projects for the future. Since 1998, the earliest year for which we could obtain annual return data, the geometric mean return was 5.6 percent and the standard deviation of annual returns — an indicator of the risk of the investment portfolio — was 9.5 percentage points.

While PERS' historical performance has been solid, it may be more difficult to achieve projected returns going forward than it was in the past. The simple reason is that the riskless return paid on Treasury securities — the foundation on which a risky portfolio is built — has fallen. In 1985, for instance, the yield on 30-year Treasury securities was over 10 percent, meaning that a pension plan could exceed 8 percent nominal returns while taking almost no risk. Today, the 30-year Treasury yield is around 4 percent, meaning that a plan must take significantly more risk to generate the same nominal return as in the past. At the same time, PERS notes that its goal for real returns, net of inflation, rose from 3 percent in 2000, to 3.5 percent in 2002, to 3.75 percent in 2003 and 4.5 percent thereafter,² despite falling yields on inflation-indexed bonds.

Wilshire Associates projects that the typical public pension will generate nominal returns going forward of around 6.5 percent, a return that if realized would significantly

¹ Biggs, Andrew G. "How Have Public Sector Pensions Responded to the Financial Crisis?" Prepared for presentation at the Wharton School/Pension Research Council Symposium. "Reshaping Retirement Security: Lessons from the Global Financial Crisis." May 05-06, 2011.

² Nevada PERS CAFR, p. 58.

increase costs to Nevada PERS.³ Common sense dictates that the plan may need to take more investment risk in coming years if it wishes to match its past record of returns.

As this study will make clear, public-pension accounting ignores market risk, but — as experience around the country has shown over the past several years — risk has real costs for governments, taxpayers and employees who may have to increase contributions at the time they are least able to do so.

Current financing health

Public-sector pensions measure their financial health by comparing their assets to their liabilities. The ratio of assets to liabilities — referred to as the “funding ratio” — indicates the percentage of liabilities that is funded. The difference between assets and liabilities denotes the plan’s unfunded liability.

As of June 2010, the latest date for which comprehensive data is available, PERS had actuarial assets of \$24.7 billion and liabilities of \$35.1 billion, which combine to produce a funding ratio of 70.5 percent and an unfunded liability of \$10.4 billion. Within these seemingly simple numbers, however, a great argument rages, one that has the potential for impact far beyond the actuaries and economists who are currently engaged in the debate.

Actuarial Versus Market Assets

To begin, actuarial assets differ — sometimes significantly — from the actual market value of the plan’s assets. Actuarial assets are sometimes referred to as “smoothed assets,” because their value is calculated using a rate of return that is smoothed to even out fluctuations from year to year.

Nevada smoothes returns over a five-year period, meaning that the return applied to assets in a given year is effectively an average of returns over the prior five years. This method reduces — or, some might argue, hides — the year-to-year volatility from investing in risky assets. The market value of PERS’ assets as of June 2010 was \$20.9 billion, over 15 percent below the actuarial value of assets. Other pension plans around the country report a similar gap between actuarial and market values of assets. Using the market value of assets, PERS would be around 60 percent funded versus the 71 percent reported value.

Smoothing returns is appropriate as a means to even out funding requirements from year to year. A plan shouldn’t have to increase funding during a down market, since that will tend to be a time when the economy and tax revenues also are down. Optimally, pensions

³ See Wilshire Consulting (2011). “2011 Wilshire Report on State Retirement Systems: Funding Levels and Asset Allocation.” February 28, 2011.

would increase contributions in good times and reduce them in bad times. The pattern in too many states, however, has been to reduce contributions in bad times and then to keep them low, resulting in an underfunded pension plan. To its credit, Nevada PERS has generally paid its full annual contributions over time despite significant financial pressures.

However, smoothed returns and actuarial assets are *not* appropriate as a way to measure the actual financial health of the program. What matters for the ability to pay benefits is the actual assets on hand. To put it in more practical terms, if the actuarial value of the plan's assets exceed the market value, then the actual future rate of return on investments must exceed the projected return in order for the plan to be solvent as described. For instance, PERS' current funding estimates are based on the actuarial measure of assets and an assumed 8 percent annual rate of return. In reality, though, because the market value of PERS' assets is roughly 15 percent below the actuarial value, PERS must generate returns even higher than 8 percent since it first must bring the market value of its assets back up to equal the actuarial value. Over a 30-year period, this implies a true target return of around 8.6 percent, which is ambitious.

Assuming a different rate of return can have a huge effect on the measured value of a pension plan's liabilities.

Valuing Liabilities

Nevada PERS and other public-pension plans value their liabilities by discounting future benefit payments to the present using the expected return on plan investments, which for PERS is 8 percent. For instance, if the plan projected it would pay out benefits worth \$1 million in the year 2026, the present value would equal $\$1,000,000 / (1.08)^{15} = \$315,242$.⁴ Using this basic approach, PERS values its total benefit liabilities at \$35.1 billion, consisting of about \$27.6 billion for regular employees and \$7.5 billion for the far more generous police and firefighter fund. Under these accounting methods, the employer's normal cost – that is, the cost of benefits accruing in a particular year – is 14.4 percent of salaries for regular employees and 28.1 percent of salaries for police and firefighters, for an average of around 16.6 percent of pay.⁵ Valuation under this approach is consistent with rules set out by the Governmental Accounting Standards Board (GASB), which sets non-binding disclosure rules for public pensions.

It is said that compound interest is the most powerful force in the universe. Certainly, assuming a different rate of return can have a huge effect on the measured value of a pension plan's liabilities. Among public plans, the assumed return on investment varies from a low of around 7 percent to a high of around 8.5 percent. Assuming the same actual

⁴ This simple example assumes annual compounding.

⁵ Nevada PERS Comprehensive Annual Financial Report. June 30, 2010. p. 93.

Table 1. Summary Data for Nevada PERS Financing as of June 30, 2010.

	Regular	Police/Fire	Total
Dollars			
Employer normal cost	712,018,796	271,754,563	983,773,359
Employee contribution	90,295,302	16,741,883	107,037,185
Total normal cost	802,314,098	288,496,446	1,090,810,544
Unfunded liability	7,950,505,956	2,401,769,113	10,352,275,069
Annual amortization payment	387,114,092	116,943,334	504,057,426
Payroll	4,943,566,092	968,353,118	5,911,919,210
Percent of payroll			
Employer normal cost	14.4%	28.1%	16.6%
Employee contribution	1.8%	1.7%	1.8%
Total normal cost	16.2%	29.8%	18.5%
Unfunded liability	160.8%	248.0%	175.1%
Annual amortization payment	7.8%	12.1%	8.5%
Total employer cost	22.2%	40.1%	25.2%

Source: Nevada PERS CAFR, June 30, 2010.

benefit payments, PERS measured liabilities would rise to roughly \$40 billion if it assumed a 7 percent return and fall to \$33 billion assuming an 8.5 percent return. In the real world, this shows how sensitive the plan’s funding health is to the actual rates of return it realizes on its investments.

The following sections will discuss whether this basic approach — using the expected interest rate paid on investments to determine the value of a plan’s liabilities — makes sense. For now, though, it is simply worth pointing out that this approach creates a strong incentive for pension plans to hold riskier investments, since risky investments can generate higher expected returns and higher expected returns lower the measured value of a pension’s liabilities and the annual contributions necessary to fund them. And over time, public-pension investments have grown significantly more risky. In the early 1980s, public plans generally held around one-third of their assets in stocks, according to Federal Reserve data. Over time, the equity share grew to over two-thirds. More recently, the trend has been toward so-called “alternative investments,” which include private equity, hedge funds, and the like. These investments carry higher potential returns than stocks, but also more risk.

On paper, Nevada PERS and pensions around the country could make themselves technically solvent simply by investing in riskier assets.

The Market Valuation Debate

The traditional means of valuing a public pension's liabilities — by discounting future payments back to the present using the interest rate projected to be earned on plan assets — was devised by actuaries decades in the past. And when public pensions held few risky assets, investing mostly in bonds, annuities and the like, such an approach was not wildly inappropriate in practice, even if, as we will see, it is entirely contrary to economic theory. However, it should be made clear that the current practice, which we will call actuarial valuation, is inconsistent with the views of the vast majority of financial economists, with the ways that financial markets value liabilities, and with the rules that private-sector pensions are required to adhere to.

Before explaining how economists value liabilities, it may make sense to point out one obvious problem with how public pensions currently measure their finances: A pension plan that takes more investment risk automatically is considered better funded. That improvement in funding occurs immediately, before the higher expected returns are

actually earned and increases no matter how much risk the plan chooses to take.

As shown above, if PERS shifted its portfolio from one with an expected return of 8 percent to a riskier portfolio with an expected return of 8.5 percent, the measured value of its liabilities would immediately fall by around \$2.4 billion and its funding ratio would rise from 70 percent to around 76 percent. On paper, Nevada PERS and pensions around the country could make themselves technically solvent simply by investing in riskier assets.

According to GASB accounting, one dollar of stocks is effectively worth two dollars of bonds ...

Reality is a different story. The obvious flaw with this approach is that a portfolio does not become more valuable simply because it has a higher expected rate of return. Simply put, one dollar of stocks is worth the same as one dollar of bonds. Each has a combination of risk and return that buyers and sellers in the market value at one dollar. But according to GASB accounting, one dollar of stocks is effectively worth two dollars of bonds, because it allows a plan to discount its liabilities using a much higher interest rate. Economists, as a profession, simply believe this approach is wrong — no two ways about it.

The economic approach to valuing a future liability is to discount it using an interest rate based on the risk or safety of the *liability*, not of any assets set aside to fund the liability. If a liability is guaranteed to be paid, as public-pension benefits are intended to be and as state laws and constitutions rule they must be, then they should be discounted using a low interest rate. Donald Kohn, then the vice chairman of the Federal Reserve Board, explained it in these terms:

I mentioned earlier that current measures of pension liabilities might be less than fully revealing. Why might that be so? The chief reason is that public pension benefits are essentially bullet-proof promises to pay. We all have read about instances in which benefits were lost when a private-sector pension sponsor declared bankruptcy and terminated the plan. In the public sector, that just hasn't happened, even when the plan sponsor has run into serious financial difficulty. For all intents and purposes, accrued benefits have turned out to be riskless obligations. While economists are famous for disagreeing with each other on virtually every other conceivable issue, when it comes to this one there is no professional disagreement: The only appropriate way to calculate the present value of a very-low-risk liability is to use a very-low-risk discount rate.⁶

Likewise, the market valuation perspective is also well summarized by Federal Reserve Board economist David Wilcox, who testified before the American Academy of Actuaries on the topic of public-pension accounting:

The economics of how cash flows with no credit risk should be discounted back to the present are completely unambiguous and utterly noncontroversial. Those cash flows should be discounted back to the present using interest rates that are derived from securities with no credit risk. Every first year MBA student, even as we speak, is having this simple point drilled into their head right now in an introductory finance class. The only factors that matter for the determination of the scale of these obligations are the size of the promised cash flow and their essential characteristic, which is that they are free of risk. That's all you need to know. These are riskless cash flows. There's an unambiguous answer as to what their value today is. What I'm trying to suggest, over and over again, is that the analytics of valuing cash flows that have no credit risk in them — those analytics are very straightforward. There's no professional dispute associated with that question. These happen to be really simple cash flows to value. They're free of credit risk. There's only one conceptually right answer to how you discount those cash flows. You use discount rates that are free of credit risk. This is one of those things where it just really is that simple.⁷

Public-sector pension benefits are essentially future payments from the government that are guaranteed by the government — in other words, they are very similar to government bonds. For that reason, economists believe that public pensions should discount their liabilities not at the expected return on assets, but at the interest rate paid on government bonds. Governments couldn't discount the value of their outstanding debt simply because they set aside money in stocks to meet their future payments; economists see no reason

Public-pension accounting rules aren't merely out of step with economic theory, but with the federal rules by which private-sector pensions must operate.

⁶ Kohn, Donald L., "Statement at the National Conference on Public Employee Retirement Systems Annual Conference." New Orleans, Louisiana, May 20, 2008. <http://www.federalreserve.gov/newsevents/speech/kohn20080520a.htm>.

⁷ Wilcox, David. Testimony before the Public Interest Committee Forum sponsored by the American Academy of Actuaries, September 4, 2008.

that pension plans should do otherwise. As Wilcox notes, this is simply taken for granted by economists and financial markets, such that they often are surprised that public pensions and their actuaries argue otherwise.

Moreover, economists argue, public-pension benefits have, in practice, turned out to be even *less* risky than the bonds issued by state and local governments. As Brown and Wilcox (2009) note, in the mid-1970s New York City's financial crisis forced it to cut 61,000 jobs and freeze employee wages, while inflicting losses on its bondholders, yet it never failed to pay full pension benefits. Likewise, Orange County, Calif., declared bankruptcy in the 1990s and was forced to cut 1,600 public-sector jobs and default on \$1.1 billion of bonds.⁸ Nevertheless, Orange County paid vested pension benefits in full. Rauh and Novy-Marx (2009) assume public-pension benefits to have a probability of default similar to that of U.S. Treasury bonds, making an accrued public-pension benefit one of the most secure assets in the world.⁹

A private pension may not treat a risky return as a certain return by crediting itself with higher returns before the returns have actually been earned. ...

Public-pension accounting rules aren't merely out of step with economic theory but with the federal rules by which private-sector pensions must operate. Private pensions, like those in the public sector, may invest in risky assets if they wish. But they may not credit themselves with the higher returns on risky assets until those returns have actually been generated. Under federal accounting rules, private pensions discount their liabilities at the interest rate paid on a portfolio of high-quality corporate bonds, currently around 5.5 percent. A private plan may take more investment risk, but that does not change the value of the plan's liabilities. If risky investments pay off, then the private plan will be shown to be better funded, since the value of its assets will be higher. *But a private pension may not treat a risky return as a certain return by crediting itself with higher returns before the returns have actually been earned.*

While this approach sounds odd at first, it is not merely an ivory tower, academic approach. It also is how financial markets value liabilities. A company does not become more valuable in the eyes of shareholders if it funds its pension with stocks rather than bonds. Doing so makes the company's finances more risky. The company's shareholders become *de facto* holders of the stocks in the company's pension fund, and to the shareholders the extra return on stocks is merely compensation for the extra risk — it does not make the company more valuable. Similarly, a public-sector pension plan that takes an aggressive financing strategy makes smaller contributions today, which it invests

⁸ Brown, Jeffrey R. and Wilcox, David W., "Discounting State and Local Pension Liabilities," *American Economic Review*, vol. 99, May 2009.

⁹ Novy-Marx, Robert and Rauh, Joshua D., "The Liabilities and Risks of State-Sponsored Pension Plans," *Journal of Economic Perspectives* 23(4), Fall 2009.

in risky assets. The risk of these assets places a contingent liability on the taxpayer to bail out the fund, should the investments fall short. On the other hand, a plan that took a conservative funding approach would make larger annual contributions, but because these would be in less risky investments the contingent liability on taxpayers would be smaller. The total cost of funding a given dollar of benefits — the contribution plus the value of the contingent liability — is the same regardless of what financing strategy is chosen. Public-pension accounting is flawed, because it focuses on only one aspect of the plan’s funding strategy — how much the plan must contribute each year — while ignoring the value of contingent liabilities placed on taxpayers.

The key defect in the accounting rules under which PERS functions is that the contingent liability on taxpayers is simply ignored.

But as we have seen over the past several years, contingent liabilities — be they to Wall Street, Fannie Mae and Freddie Mac, General Motors and Chrysler, or public-sector pension funds — are real and potentially extremely expensive. It is possible to illustrate, using financial products known as options, that only the market-valuation approach fully captures the value of these contingent pension liabilities placed on taxpayers.

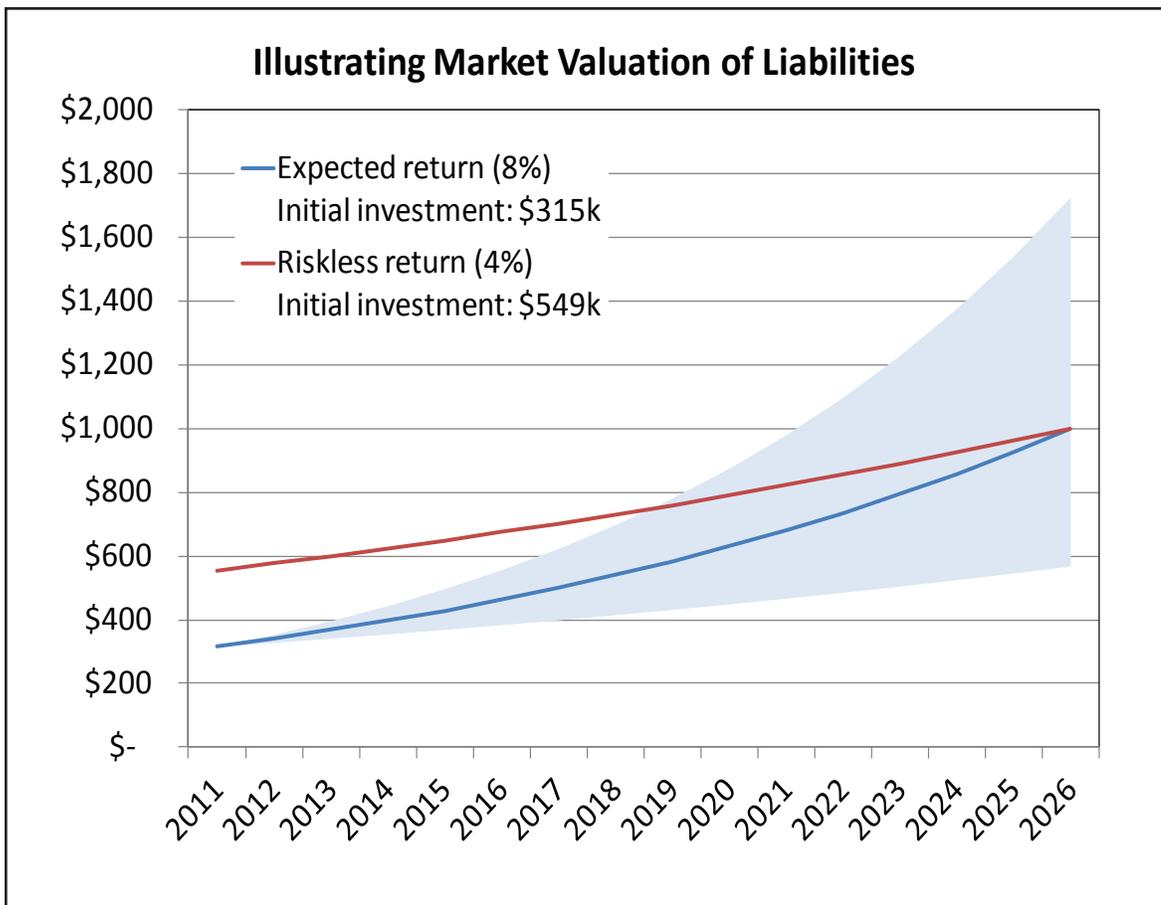
The key defect in the accounting rules under which PERS functions is that the contingent liability on taxpayers is simply ignored. GASB acknowledges that this liability exists, but its accounting rules nowhere incorporate its value.¹⁰ Financial economics and financial markets, by contrast, value such liabilities every day. What the following example will show is that, no matter how you choose to finance a given liability, the value of the liability itself stays the same. And that value is best described using the market-valuation approach.

Illustrating Market Valuation

Imagine a pension plan that owed a guaranteed lump sum payment of \$1 million in 15 years’ time. Under GASB rules, if the plan invested \$315,000 today — the present value of \$1 million when discounted at an 8 percent interest rate — it could call itself fully funded. According to market valuation, since the payment is guaranteed, it should be discounted at a guaranteed interest rate of around 4 percent, which would produce a present value of \$549,000. Thus, to call itself fully funded under market valuation, a pension plan would have to contribute almost twice as much up front.

Figure 1 on the following page illustrates the example. The red line indicates the initial investment growth of assets under market valuation. If the plan purchased a riskless

¹⁰ Biggs, Andrew G. “Proposed GASB Rules Show Why Only Market Valuation Fully Captures Public Pension Liabilities.” *Financial Analysts Journal*, March/April 2010.



investment with a 4 percent return and held it to maturity, the red line would indicate the growth of the plan’s assets until the liability needed to be paid. The blue line shows something similar under GASB assumptions, where a smaller initial investment grows at a higher rate until it is worth the same \$1 million 15 years hence. Understandably, public officials and public employees prefer the blue line.

Here’s the problem: the blue line simply is not an accurate depiction of what an investment in risky assets looks like. Rather, instead of a blue line, in the real world we have something like the blue shaded *area*, which shows a range of possible outcomes. The investment might hit \$1 million spot on the money, but it’s much more likely either to overshoot or undershoot. In fact, due to how stock returns are distributed, with a small number of extremely high returns and a larger number of more modest returns, a portfolio with an expected rate of return of 8 percent actually has a less than 50 percent chance of achieving 8 percent returns in practice. Due to this skew in returns, Rauh and Novy-Marx note, an investment portfolio with an expected average return of 8 percent actually has only about a one-third probability of achieving that return over the next 30 years and has a 50 percent chance of achieving a return below 6 percent.¹¹

¹¹ See Statement of Professor Joshua Rauh. “The Role of Public Employee Pensions in Contributing

Neither overshooting nor undershooting is what the plan is looking for. If it overshoots, that means some initial money was wasted up front. If the investments come up short, by contrast, the plan won't be able to pay what it owes and must turn to the taxpayer for a bailout. However, there are financial products — called “options” — that provide an answer. A “call option” allows the pension plan to sell off any proceeds if the plan's investment turns out to be worth more than \$1 million. The proceeds of that sale can be used to offset the cost of the initial investment. Likewise, a “put option” acts as insurance against the times when the investment turns out to be worth less than \$1 million. The put option will top up the difference to be sure the plan is able to pay what it has promised. Of course, the cost of this insurance policy would need to be added to the upfront investment to get a true feel for the pension's total liability.

The key insight of financial economics is that it costs far more to insure against bad outcomes than can be reaped by selling off the rights to good outcomes. The reason for this is that the value of a dollar depends upon what else is going on in the world at the time it is paid. A pension fund is likely to generate surplus dollars in strong economic times, when incomes are high and jobs are plentiful, meaning that people will not pay as much for that dollar as if it were paid when times were bad and money was hard to come by. As Washington State's actuaries noted with regard to their plan's financing, “Weak economic environments were correlated with weak investment returns. Lower investment returns created the need for increased contributions at a time when employers and members could least afford them.”¹² In other words, when it rains it pours: the taxpayer guarantee to pay full pension benefits is likely to be needed in times of high unemployment, low tax revenues and other pressures on state and local budgets — that is, taxpayers will be asked to pay at the time they are least able to do so.

The taxpayer guarantee to pay full pension benefits is likely to be needed [when] taxpayers will be least able to [pay]...

The prices of put and call options in the market reflect this fact. In our stylized example above, the put option protecting against bad outcomes would cost around \$245,000 but the call option only around \$11,000. Put these values together with the original investment — \$315,000 minus \$11,000 plus \$244,000 — and you get \$549,000, which is precisely the value of the liability under the market-valuation approach.¹³

This illustration rebuts the argument that the market-valuation approach ignores the

to State Insolvency and the Possibility of a State Bankruptcy Chapter.” Statement before the House Judiciary Committee, Subcommittee on Courts, Commercial, and Administrative Law. February 14, 2011.

¹² Office of the State Actuary. “Washington State 2009 Actuarial Valuation Report.” October 2010; and Office of the State Actuary. “2010 Risk Assessment: Moving Beyond Expectations.” August 31, 2010.

¹³ This result is known as “put-call parity” and reflects the fact that market-based valuation methods should all produce the same end result, even if they calculate that result using different methodologies.

assets that pensions actually invest. The price of a put or a call option is derived from the characteristics of the underlying asset it is derived from. In the real world, the price to fully fund a payment of \$1 million 15 years hence would not be \$315,000, as pension accounting suggests. Rather, it would be \$549,000, as market valuation shows. The market value of the liability illustrates the lowest cost at which a guaranteed benefit can be guaranteed to be paid, without recourse to additional taxpayer funds. Current pension accounting rules rely on a potential taxpayer bailout to lower measured funding costs, but never reveal the importance of this potential recourse to taxpayers, nor discuss its costs.

The cost of the put option in the illustration above represents the value of the contingent liabilities that have been placed upon future taxpayers, based upon funding decisions made today. The cost illustrated by the put option is not a worst-case scenario; it is not the price that future taxpayers will bear if everything goes wrong. Rather, it represents the price that future taxpayers would willingly pay to rid themselves of the *risk* of being called on to make good on promises that were made by, and should have been paid for by, today's taxpayers.

The market-valuation approach considers both the risk and the return of a pension's investments, while conventional GASB accounting ignores risk entirely.

A real-life example from the California Public Employees Retirement System (CalPERS) may help illustrate. Some local governments that participate in CalPERS are considering terminating their DB pensions as a way to curb costs. CalPERS recently declared that terminating plans would have their liabilities valued at a low 3.8 percent discount rate rather than the 7.75 percent rate that CalPERS ordinarily uses.¹⁴ The reason, CalPERS says, is once a plan is terminated the employer can no longer be required to make extra contributions, should returns on the plan's investments fall. Under those circumstances, the plan must invest its assets more conservatively. In other words, just as the above example shows, the difference between discounting at the expected return and using the low returns dictated under market valuation is wholly a function of ignoring the value of the taxpayer guarantee to pay full pensions even if asset returns fall short. CalPERS' own logic shows this to be the case.

What this demonstrates is that market valuation isn't some esoteric, ivory tower approach that ignores the real world and the real investments that public pensions make. On the contrary: The market valuation approach considers both the risk and the return of a pension's investments, while conventional GASB accounting ignores risk entirely.

Put in simple terms, current pension-accounting rules show the lowest cost

¹⁴ "CalPERS Acts to Ensure Benefits of Terminated Agency Members." Press release, August 17, 2011. <http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-2011/aug/benefits-term-mbrs.xml>.

at which a plan could *expect* to be able to meet its obligations — that is, to have a 50 percent probability of being able to do so. The problem is that public-pension benefits are guaranteed and must be paid 100 percent of the time. Market valuation shows the cost of being able to meet those obligations 100 percent of the time.

That is why the Congressional Budget Office, in a recent analysis widely taken as a confirmation of the market-valuation approach, noted that:

By accounting for the different risks associated with investment returns and benefit payments, the fair-value approach provides a more complete and transparent measure of the costs of pension obligations... The fair-value approach also gives a more complete picture of the costs of changes in policy, to the extent that such changes would affect pension benefits (and possibly wages) for current employees.¹⁵

Risk plays no role whatsoever in current pension accounting, even as pensions take on more investment risk than ever.

How Nevada PERS Would Look Under Market Valuation

It is possible to calculate the value of public-pension liabilities using the options-pricing approach illustrated above.¹⁶ However, it is simpler to use shorthand techniques that rely on discounting plan liabilities using an appropriate interest rate. Most public-pension plans, including PERS, do not disclose the projected values of their future annual benefit liabilities. That is, the public does not know what the program is projected to pay out each year in the future. This complicates the task of converting to an appropriate discount rate. However, several public-pension plans publish estimates of their liabilities using a range of discount rates. By relying on these estimates, we can estimate how PERS' liabilities would look under market valuation. However, because each plan is somewhat different, this can only be an estimate. Nevada PERS should publish its annual benefit liabilities for future years, so outside analysts can determine how PERS liabilities would look under alternate discount rates.

Table 2. Relationship of plan liabilities to discount rate, Florida Retirement System (composite).	
Interest rate	Liabilities*
7.75% (FRS baseline rate)	\$137.64
7.50%	\$142.04
7.00%	\$151.54
6.00%	\$173.64
5.00%	\$200.54
4.00%	\$233.74
3.00%	\$274.64

Source: Milliman (2011)
*In billions.

We rely on an analysis of nine different pension plans administered under the

¹⁵ Congressional Budget Office. "The Underfunding of State and Local Pension Plans." May 2011.

¹⁶ Biggs, Andrew G. "An Options Pricing Method for Calculating the Market Price of Public Sector Pension Liabilities." *Public Budgeting and Finance*, Fall 2011.

umbrella of the Florida Retirement System. This analysis, which was requested by Florida Gov. Rick Scott and conducted by the actuarial firm Milliman, calculated the costs of funding these plans under a range of interest rates.¹⁷ Table 2 shows how the value of FRS liabilities increases as the discount rate is reduced. At the FRS baseline discount rate of 7.75 percent, the plan has liabilities of roughly \$138 billion; at a 4 percent interest rate reflecting the guaranteed nature of public-pension benefits, liabilities rise by 70 percent to \$234 billion. Shifting from a baseline discount rate of 8 percent, as used by Nevada PERS, to a 4 percent risk-adjusted return would imply a 76 percent increase in the measured value of the plan's liabilities.

If applied to Nevada PERS, using a 4 percent discount rate, PERS' reported liabilities of \$35.1 billion would rise to \$61.8 billion. Using the market value of liabilities and the smoothed, actuarial value of assets, PERS' funding ratio would fall to 40 percent. Using both the market value of liabilities *and* the market value of assets, PERS funding ratio would fall to about 34 percent. This latter figure is the best estimate of how economists would value the liabilities and what financial markets would charge to take over payment of Nevada PERS

benefits that have been obligated to date. For context, the Department of Labor considers a defined-benefit (DB) plan "endangered" if its assets equal 80 percent or less of liabilities and "critical" if 65 percent or less.¹⁸ By those standards, every public-pension plan in the country, Nevada PERS included, would be considered critical.

For instance, if PERS were to contract with an insurance company to issue annuities to cover benefits to current beneficiaries as well as benefits earned by current workers but not yet collected, the amount the insurance company would charge would be far closer to \$62 billion than to \$35 billion and, potentially, even higher. This practice of private-pension buyouts has not occurred in the U.S. due to a 2008 IRS ruling, but it is common in the United Kingdom.¹⁹ Prices charged by

private firms to take over public-pension assets would better reflect the overall economic value of benefits to employees and liabilities to taxpayers.

Using both the market value of liabilities and the market value of assets, PERS funding ratio would fall to about 34 percent.

¹⁷ See Robert S. DuZebe. "Study Reflecting Impact to the FRS of Changing the Investment Return Assumption to one of the following: 7.5% percent, 7.0% percent, 6.0% percent, 5.0% percent, 4.0% percent and 3.0% percent." Milliman. March 11, 2011. A similar analysis was conducted in Jones, Norman L., Brian B. Murphy, and Paul Zorn. "Actuarial Methods and Public Pension Funding Objectives: An Empirical Examination." Presented at Society of Actuaries Public Pension Finance Symposium. May 2009, and Office of the State Actuary. "Washington State 2009 Actuarial Valuation Report." October 2010; and Office of the State Actuary. "2010 Risk Assessment: Moving Beyond Expectations." August 31, 2010.

¹⁸ Life and Health Insurance News.com (2009). "The Big Pension Freeze." May 19. <http://www.lifeandhealthinsurancenews.com/News/2009/4/Pages/The-Big-Pension-Freeze.aspx>.

¹⁹ Ashby H. B. Monk. "Pension Buyouts: What Can We Learn From The UK Experience?" Center for Retirement Research at Boston College. September 2009.

Table 3. Summary Data for Nevada PERS Financing Under Market Valuation, as of June 30, 2010.

Dollars			
	Regular	Police/Fire	Total
Employer normal cost	2,171,657,328	828,851,417	3,000,508,745
Employee contribution	275,400,671	51,062,743	326,463,414
Total normal cost	2,447,057,999	879,914,160	3,326,972,159
Market assets (approx)	16,628,121,287	4,278,161,818	20,906,283,105
Market liabilities	48,709,012,854	13,160,388,448	61,869,401,302
Unfunded liability	32,080,891,566	8,882,226,630	40,963,118,197
Annual amortization payment	2,140,740,929	646,696,637	2,787,437,566
Payroll	4,943,566,092	968,353,118	5,911,919,210
Percent of payroll			
Employer normal cost	44%	86%	51%
Employee contribution	6%	5%	6%
Total normal cost	49%	91%	56%
Unfunded liability	649%	917%	693%
Annual amortization payment	43%	67%	47%
Total employer cost	87%	152%	98%
<i>Author's calculations based on data from Nevada PERS 2010 CAFR.</i>			

The effect of market valuation on annual funding costs would be even larger. Again based upon the analysis of the Florida Retirement System, the normal cost of accruing benefits under PERS would rise from around 17 percent of payroll to about 51 percent. To provide the intuition behind these figures, the market value of the normal cost represents the size of the contribution to a defined-contribution, 401(k)-type plan that, invested in U.S. Treasury securities yielding 4 percent, would be sufficient to produce the same level of benefits with the same level of risk as Nevada PERS.

The effect of market valuation on contributions to amortize unfunded liabilities from prior years would be larger: Total contributions toward unfunded liabilities would rise from about 8.5 percent of worker salaries to about 47.1 percent. The total Annual Required Contribution, which encompasses the normal cost of accruing benefits and amortization payments toward unfunded liabilities, would increase from about 27 percent of total payroll to about 98 percent. In dollar terms, this is about \$5.8 billion in required annual contributions, equal to about one-fifth of the combined state and local government budgets.

Again, these estimates are based on the composite values for nine plans under the Florida Retirement System and can differ for Nevada PERS. The size of the funding increases required under more realistic discount rate assumptions makes it even more important that PERS release the necessary data so that independent outside experts can conduct their own analysis.

Public pensions have promised too much in terms of benefits, funded too little, and taken on excessive risk.

These figures are so alarming that it is tempting to simply dismiss them. This has been the reaction of many pension administrators, who too often view themselves as advocates for public employee benefits and forget their obligations to the taxpayer. Plan managers may take issue with market valuation if they wish. But they cannot deny that the overwhelming majority of professional economists, as well as financial market participants, would consider these figures to be the most accurate.

Current accounting standards for public-sector pension plans provide a highly distorted view of those plans' true liabilities as well as implying that plans can reduce their liabilities and improve their funding status by taking on additional investment risk. As a result of these accounting errors, public pensions have promised too much in terms of benefits, funded too little, and taken on excessive risk. Improving accounting to reveal the true value of public-pension liabilities is an important step toward making these plans more sustainable and having them pose less financial risk to taxpayers. Lawmakers must know how big the problem is and what will — and won't — fix it. But making public-sector pension plans sustainable will involve difficult policy choices. One choice we examine in a following section is whether to shift public-sector pensions toward a defined-contribution model, similar to the 401(k) plans that most private-sector workers currently participate in.

Objections to Market Valuation

In response to the market valuation critique, public-pension administrators, public-pension actuaries and others have offered a number of responses. Many seem compelling at first glance but do not hold up under greater scrutiny.

Long Time Horizons

It is often argued that government, due to its supposedly longer time horizons, need not worry about year-to-year fluctuations in asset returns. This argument is based on the idea of "time diversification," which holds that the risk of investments like stocks declines over longer holding periods. If the government is perpetual, then it can focus on the long term and ignore shorter-term risk. For instance, in a report commissioned by Nevada PERS, the actuarial firm Segal states:

Furthermore, the longer time horizon of a DB plan allows the DB plan to diversify along the time axis as well. A retired DC member must choose less and less risky assets as he or she ages in order to be certain the DC member can draw a steady income. This means he or she must accept a lower return as the member ages. Alternatively, an ongoing DB plan can spread the investment risk over a population of both young and old members.²⁰

Most financial economists believe that Segal’s statements about “diversifying over time” are simply wrong. Indeed, it is troubling that public-pension managers and consultants blithely cite “time diversification” when a simple Internet search on that phrase will often pair it with the words “fallacy,” “myth” and other such hints that caution should be used in applying the theory to multi-billion dollar investments. Even the investment firm Vanguard — well-known as an advocate of buy-and-hold investing — states that “there is little evidence to support the notion that time moderates the perceived volatility inherent in risky assets.”²¹

Most financial economists believe that Segal’s statements about “diversifying over time” are simply wrong.

Why is this the case? Well, consider the spread of investment outcomes illustrated in Figure 2. Does this range ever get smaller over time, indicating lower risk? No. The longer the holding period, the wider the range of potential outcomes — good or bad.

Actuaries rely on the fact that the standard deviation of returns — a common measure of investment risk — declines over longer holding periods. But this ignores the fact that the effects of compounding trump the effects of lower risk. To illustrate, consider an investor holding stocks over various time periods. If that investor holds stocks for one year and receives a return one standard deviation below the mean, he would end up with around 19 percent less than someone who received the average return. Over five years, a person who received a return one standard deviation below the mean would end up with 35 percent less, and over 10 years, 45 percent less. And on and on.

The standard deviation of annual returns may decline over longer holding periods, but the standard deviation of the *total* return — that is, the actual end values of the investment — grows larger, and it is the total return that matters. This explains why guarantees against low market returns — which should be less expensive over long periods, if the time diversification argument is correct — actually grow *more* expensive over time.²²

²⁰ The Segal Company. “Public Employees’ Retirement System of the State of Nevada. Analysis and Comparison of Defined Benefit and Defined Contribution Retirement Plans.” December 14, 2010.

²¹ Vanguard Investment Counseling & Research. “Time Diversification and Horizon-Based Asset Allocations.” 2008.

²² Bodie, Zvi, “On the Risk of Stocks in the Long Run,” *Financial Analysts Journal*, May-June 1995.

'Government is Different'

Some also argue that standards applied to private-sector firms and private financial markets need not apply to government, which is (in some unstated way) fundamentally different from other financial actors. While this view appears reasonable at first glance, it falls apart under scrutiny. A comparison to private corporations may help illustrate. Private corporations once were thought of as individual financial actors, such that the corporation

paid taxes, bore risk and so forth. One of the insights of financial economics, in particular the Modigliani-Miller theorem of corporate finance (which garnered economist Franco Modigliani a Nobel Prize) was that a corporation should properly be analyzed from the point of the individuals who participate in it, which could include stock and bondholders, employees, etc. In short, a corporation is a pass-through entity that passes risks and rewards to its stakeholders. Financial decisions should be analyzed from the point of view of these stakeholders, not of some anthropomorphized "corporation."

Similarly, government is a pass-through entity. As the Congressional Budget Office has pointed out, "The government does not have a capacity to bear risk on its own."²³ Rather, government *transfers* risk between different stakeholders, such as taxpayers, public employees, bondholders, and beneficiaries of government programs, just as a corporation transfers risk to stock and bondholders, employees and, where possible, customers. To realize the truth of this, we need merely to look around us: All over the country, taxpayers are contributing more to pensions,

other programs are starved of revenues, and bondholders are beginning to worry about the safety of their investments. It is these individuals, not "the government," who are paying the cost for market declines that have hit pension investments. The implication of this — the CBO has argued in contexts ranging from student-loan guarantees, to bank deposit insurance, to guarantees against market risk for Social Security personal accounts — is that governments should value risk the same way that their stakeholders do, using market signals and market prices.²⁴ Likewise, Nobel Prize-winning economist Robert Merton has specifically cited federal guarantees for private-sector pensions — which are equivalent to the taxpayer guarantee of public-sector pensions — as an appropriate area for market-valuation approaches.²⁵ The argument that a government program should be immune from market pricing simply doesn't fly with economists.

Government transfers risk between different stakeholders, such as taxpayers, public employees, bondholders, and beneficiaries of government programs...

²³ Congressional Budget Office, "Estimating the Value of Subsidies for Federal Loans and Loan Guarantees," August 2004.

²⁴ See Lucas, Deborah and Phaup, Marvin. "The Cost of Risk to the Government and Its Implications for Federal Budgeting," National Bureau of Economic Research, 2007.

²⁵ Merton, Robert. "Applications of Option-Pricing Theory: Twenty-Five Years Later," *American Economic Review*, vol. 88, no. 1 (March 1988), pp. 323-349.

Economic theory does say there are certain instances in which government *can* ignore risk, namely when those risks are both small and uncorrelated to the government's other assets and liabilities.²⁶ Something like building a public university might qualify, but holding billions in equities and other risky assets is an entirely different story. Despite the prevailing story that government can ignore risk, the academic research supporting this claim is very limited.

How Generous are PERS Benefits?

PERS reports that its average monthly benefit for non-public-safety participants in 2010 was \$2,486, or \$29,832 per year. It is hard to judge the generosity of this benefit level relative to private-sector standards, however, because it is an average that includes both employees with short public-sector careers and older retirees, for whom benefits are lower because their working careers took place when average salaries were lower than today.

The argument that a government program should be immune from market pricing simply doesn't fly with economists.

A better measure is a head-to-head comparison: Take the same individual with the same earnings and calculate what he would be likely to receive through PERS versus benefits from a typical private-sector 401(k) plan combined with Social Security. To make such an analysis requires a number of simplifying assumptions.

We begin with a representative worker who was born in 1944 and retires in 2009. We compare benefits accrued over a 30-year working career, to more accurately capture what a typical public employee might receive.²⁷ It is assumed that both the public- and the private-sector employee earn 150 percent of the national average wage each year, to account for the generally greater educational level of public-sector employees. The average wage economy-wide today is slightly over \$40,000, although the actual wage level does not affect the results a great deal.²⁸ Average wages are derived from the Social Security Administration's Average Wage Index series. It is assumed that workers receive benefits based upon the formula in place today, to catch the relative benefits accruing to workers currently in the labor force.

We assume that the private-sector worker participates in Social Security, for which he and his employer each pay 6.2 percent of wages. He also participates in a typical 401(k)

²⁶ Arrow, Kenneth J. and Lind, R.C., "Uncertainty and the Evaluation of Public Investment Decisions," *American Economic Review*, Vol. 60, 1970.

²⁷ The actual length of the working does not matter a great deal for these comparisons, so long as the public- and private-sector employee are assumed to have the same work lives.

²⁸ In general, relative to private-sector benefits, higher-paid public employees will fare better and lower paid employees worse, because Social Security benefits are paid on a progressive basis. Regardless of income, however, almost all public employees would receive higher benefits than in the private sector.

pension with an employer match; the worker's contributions are matched 50 cents on the dollar up to a maximum match of 3 percent of wages. We assume that the private-sector worker maximizes this match by contributing 6 percent of wages. Total employee contributions are 12.2 percent of wages while employer contributions total 9.2 percent of wages, for a combined annual contribution of 21.4 percent of wages. PERS is likewise financed by employer and employee contributions of 12 percent of wages each, for a total of 24 percent of wages.

Total benefits under PERS are 55 percent more generous as those for a typical private-sector worker with Social Security and a 401(k).

In addition, a number of assumptions are made regarding pension contributions, accumulation and draw-down. First, investments in defined-contribution accounts are assumed to earn a 4 percent interest rate; this approach, which follows the Congressional Budget Office, is designed to adjust returns to simulate a DC pension benefit that has the same guaranteed nature as a DB plan.²⁹ Using the expected return from a mixed portfolio of stocks and bonds would produce higher DC balances and retirement income, but would not account for the fact that DC pensions are variable while public-sector DB pensions are guaranteed.

Second, it is assumed that holders of DC accounts purchase at retirement a single life, inflation-indexed annuity. Annuity rates are derived from the federal Thrift Savings Plan; for current 65-year-olds, a \$100,000 premium would be sufficient to purchase a real annuity paying approximately \$450 per month for life.³⁰ Lacking inflation protection, initial annuity payments would be higher (around \$625 per month based on a \$100,000 premium) but would decline in purchasing power due to rising prices in following years.

At retirement, the private-sector worker would receive a Social Security benefit of around \$1,691 per month and an annuity drawn from his 401(k) of \$787, for a total monthly benefit of \$2,478. This is equal to around 48 percent of his final salary. Most financial advisors recommend a "replacement rate" of 70 to 80 percent of pre-retirement earnings, meaning that the private-sector worker should save more to provide for a comfortable retirement. We do assume only a 30-year working career, so the employee could supplement this by saving in other years.

At retirement, the same worker under Nevada PERS would receive a monthly benefit of around \$3,841.³¹ This amount is equal to about 74 percent of final earnings, which is

²⁹ Congressional Budget Office. "Evaluating and Accounting for Federal Investment in Corporate Stocks and Other Private Securities." 2002.

³⁰ Annuity rates from Thrift Savings Plan as of November 2009; available at <http://www.tsp.gov/calc/annuity/annuity.cfm>.

³¹ Based on estimates from the PERS benefit calculator: <http://www.nvpers.org/public/gbeEstimator/gbeEstimatorStart.jsp>.

sufficient for a comfortable retirement even based on an only 30-year working career.

Total benefits under PERS are 55 percent more generous than those for a typical private-sector worker with Social Security and a 401(k). Over a full working career, rather than the 30-year period we simulate, the difference would be even greater. Whether these more generous benefits combine to produce a more generous overall compensation package is a different question, one that depends upon relative salaries and non-pension benefits between public- and private sector employees. However, Nevada pays its state and local government employees salaries that are roughly comparable to those of private-sector individuals with similar levels of education and experience.³² Thus, a significantly more generous pensions package likely implies that overall public-sector compensation in Nevada is above private-sector levels.

Should Nevada Switch to a Defined-Contribution Model?

Under a defined-benefit pension plan, employees are promised a benefit through a formula based on final salary and the number of years of service. While employers make contributions to DB pensions, and these contributions are invested in a variety of assets, the risk in a DB plan is generally borne by the employer. In a defined-contribution plan, by contrast, employees receive a contribution to an investment account, which the employee then owns and must manage. Employees generally can choose their own investments, within certain limits, and bear the risk and return of those investments over time. The majority of private-sector workers now participate in DC pensions, and DB pensions in the private sector have been declining over the past several decades.

Magical thinking regarding DB plans has led to widespread underfunding and excessive risk-taking.

Would a shift to DC pensions be appropriate for the public-sector workforce? To decide, we must be clear regarding what DC plans can and cannot do. A DC pension is not a panacea, such that it can magically produce higher benefits at lower cost than a DB plan. Public pensions' unfunded liabilities, which are best measured on a market-valuation basis, are real. Moreover, they are based on benefits promised to date, meaning that changes to how future benefits are earned would have little effect on the size of the pension funding gap. As we have seen, magical thinking regarding DB plans has led to widespread underfunding and excessive risk-taking. We should not repeat those mistakes in a shift to a DC pension approach.

³² Data from the Census Bureau's Current Population Survey indicate that Nevada public employees receive salaries 1.5 percent below those of comparable private-sector workers. On average, state and local employees nationwide receive salaries around 9.8 percent below private-sector levels, though more generous benefits generally narrow or more than make up the difference.

Nevertheless, when in a hole, the first rule is to stop digging. Market valuation shows that public-sector pensions are not even fully funding benefits at the margin, meaning that new benefits accrued in a given year are not being fully paid for. DC pensions, where the accounting is clear and funding is real, have the potential to restrain costs and put pension funding back on track.

It is important to stress, however, that defined contribution need not equal 401(k). While 401(k) plans have many advantages, they also have drawbacks — many of which are currently being addressed by employers and lawmakers. A government entity considering a defined contribution has other models to consider, including DC plans for university employees and the Thrift Savings Plan offered to federal government workers. By drawing from each, a DC plan can be constructed to avoid many of the shortcomings of 401(k) accounts.

One way of thinking about DC-plan design is to consider the various objections to DC accounts. Many of these are included in studies sponsored by public-sector DB programs, including Nevada PERS, which seek to blunt any shift toward DC pensions. Here we consider a number of objections and potential responses.

Investment Risk

It is argued that DB plans can more efficiently manage risk than can individual investors holding DC accounts. This is likely to be true — the question is how large this advantage actually is. The PERS Segal report notes that large DB plans can invest in a broader range of assets, including real estate and private equity, which allows them to generate higher returns at lower risk than can an individual with a more limited range of asset choices. Put in investment terms, Segal argues that PERS' efficient frontier — that is, the possible trade-offs between risk and expected return available to the fund — is *more* efficient than that available to an individual investor. If true, however, this should be easily and publicly quantified: PERS should release its estimates of the risk and return of its current investment portfolio and the efficient frontier along which it believes it can trade risk and return. After all, a large array of investment options is available to individual investors, including low-cost index funds that diversify among thousands of stocks and bonds and include both foreign and domestic investments. It is not clear how large are the advantages to holding more exotic investments, or how large PERS believes them to be. PERS also should release details on the risk its investments have exhibited to date. But, as pensions often shift their portfolios over time, especially toward more risky investments, past risk may not be representative of the risk the plan is taking today. This is particularly true given that, as noted above, the riskless rate of return offered

PERS should release its estimates of the risk and return of its current investment portfolio and the efficient frontier along which it believes it can trade risk and return.

by Treasury securities today is significantly lower than it has been in the past.

To the degree that policymakers are concerned about individuals' capacity to manage their investments, they could do as Utah did in establishing its own DC plan: have assets managed by the existing DB pension system, giving participants the advantage of professional management along with the portability of a DC approach. Alternatively, a professionally managed plan could be offered as an option. It could be expected that many would take the centrally managed option. Either approach shows that it would be possible to offer participants the cost and return advantages of centrally managed investment through a DC pension structure.

Management Fees

High management fees can be a problem with a DC pension plan, but they need not be, if plan designers make low costs a priority. Private 401(k) plans often have high costs because many are small, meaning that fixed costs are relatively high, and because insufficient attention is paid to the fees attached to investment choices. However, it is misleading to compare administrative cost for a large DB plan to the average for 401(k) plans, about 90 percent of which have fewer than 100 participants and about two-thirds of which have less than \$1 million in plan assets.³³ Large plans, such as for public employees, can provide either DB or DC pensions at relatively low costs.

The Investment Company Institute, for example, calculates that large DC pension plans, meaning those with assets in excess of \$500 million, have an "all in" administrative cost equal to around 0.41 percent of assets under management, with a range from 0.14 percent to 0.61 percent.³⁴ Nevada PERS spends roughly \$35 million per year on administrative costs, including both direct administration and investment fees. Together, these constitute roughly 0.17 percent of assets under management. Thus, there exist DC plans with lower administrative costs than PERS. Were PERS to shift to a DC basis, it is likely that costs would remain very low. Due to the relative simplicity of DC pensions, once in place, a DC plan would require less in the way of customer service than a more complex DB structure. Moreover, should a DC plan base its investments on relatively simple index funds, as does the defined-contribution Thrift Savings Plan offered to federal government employees, fees to investment managers would drop from roughly \$25 million per year to approximately zero. The TSP, for instance, pays an investment management fee of 0.0016 percent of assets managed.³⁵ The State of Alaska's defined-contribution retirement plan,

³³ Source: Investment Company Institute, based on Department of Labor data.

³⁴ Investment Company Institute. "Defined Contribution / 401(k) Fee Study." Conducted by Deloitte for the Investment Company Institute, Spring 2009. Updated June 2009.

³⁵ FactCheck.org. "False Attacks Over 'Windfalls' to Wall Street." March 3, 2005.

another example, charges public employees a management fee of 0.11 percent of assets, plus an annual fee of \$35 for active employees. TIAA-CREF, which offers DC pension plans to many public university employees, can also serve as a model of a DC approach that overcomes many of the shortcomings found in the 401(k) universe.

While DB plans are often portrayed as ways to retain employees, they also result in burned-out teachers or physically impaired police or firefighters...

Job Mobility

Defined-benefit pensions offer a different path of benefit accumulation than do DC plans, even if the final benefit at retirement is the same. Under a DC plan, annual accumulations are roughly the same, equal to the employer contribution paid each year. In a DB plan, by contrast, benefit accruals are low in early years of employment but accelerate rapidly in later years.³⁶ This makes it very costly for workers with defined-benefit plans to change jobs, even if they would be happier or more productive in alternative employment. While DB plans are often portrayed as ways to retain employees, they also result in burned-out teachers or physically impaired police or firefighters staying on the job longer than they or the

public would prefer. Likewise, a young individual who wished to work in public service for a few years before shifting to another job would generally prefer a defined-contribution to a defined-benefit pension plan, because it allows for penalty-free transfers between jobs.

Transition Costs to DC Pensions

Some have cited so-called “transition costs” in shifting from a DB pension to a DC pension.³⁷ But these transition costs are purely a function of underfunding in the current PERS program and of accounting rules that would demand quicker repayment of these unfunded liabilities. The DC pension itself creates no new costs; moreover, a shift to a DC pension plan can be made in ways that do not entail these so-called transition costs.

Ordinarily, public pensions plan their annual contributions to be made as a level percentage of employee payroll. If payroll is growing, this makes the contribution rate smaller this year but larger in following years. Once a plan closes to new members, however, payroll will shrink over time: older members will retire, but new employees won’t take their place. This means that, relative to continuing the DC plan, contributions that fund accruing benefits and amortize unfunded liabilities will rise *relative to the plan’s payroll*. But the total dollar costs of funding the now-frozen DB system do not change. Moreover, the annual costs

³⁶ Ippolito, Richard A. “Why Federal Workers Don’t Quit.” *The Journal of Human Resources*, Vol. 22, No. 2. Spring 1987.

³⁷ See The Segal Company. “Public Employees’ Retirement System of the State of Nevada. Analysis and Comparison of Defined Benefit and Defined Contribution Retirement Plans.” December 14, 2010. Similar analyses have been conducted by other public pensions around the country. For instance, see Retirement Systems of Minnesota. “Retirement Plan Design Study.” April 1, 2011.

of funding accruing benefits under the old system remain the same. The only substantive change is that unfunded liabilities under the old DB plan must be amortized more quickly. As a memorandum prepared by the actuarial firm Gabriel Roeder Smith & Co. on behalf of the Utah retirement system stated, “It should be borne in mind that these very large contribution rates are only being charged on the small number of remaining members in the closed defined-benefit plan.”

In fact, more prompt amortization of unfunded liabilities is good policy: Spreading amortization out over decades will cause future taxpayers to pay for services rendered to past taxpayers, a violation of the principle that public pensions seek to observe of inter-period or intergenerational equity, where benefits are fully funded as they accrue and liabilities not passed to the future. The Governmental Accounting Standards Board says that inter-period equity means that “taxpayers of today pay for the services that they receive and the burden of payment for services today is not shifted to taxpayers of the future.”³⁸ GASB illustrates this concept with such terms as “living within our means” and “fairness.” The longer the amortization period, the more this standard is violated.

GASB recently introduced draft pension accounting rules that would significantly shorten the period over which unfunded liabilities may be amortized, from a norm of around 30 years to a period of around 10 to 20 years.³⁹ This rule change will increase annual amortization costs for existing DB plans, making the annual cost difference under a shift to a DC pension plan relatively smaller. A shift from a DC to a DB also involves some temporary cost increases driven by the changing age structure of pension participants.

Under a DB pension plan, a younger employee accumulates relatively few benefits per year of employment, due in part simply to his lower pay but also to the way in which a DB benefit formula is constructed. Older employees accrue benefits at a faster rate. Overall contribution rates are based upon a mix of younger and older employees. In a DB-to-DC shift, younger employees shift to a new plan while older workers remain in the current system. This increases the average rate of benefit accrual until those older workers pass through the program. To the degree that transition costs exist, there are “transition benefits” later — that is, any transition costs are not money lost but, effectively, additional prefunding of future benefits that will lead to lower costs down the road.

Put simply, the supposed higher costs of DC plans are mostly a function of the fact that DB plans have not fully funded themselves as they should.

Moreover, transition costs, particularly those driven by accounting rules, can be

³⁸ GASB, “The User’s Perspective: Interperiod Equity and What It Means to You” (June 2009): www.gasb.org/cs/ContentServer?c=GASBContent_C&pagename=GASB%2FGASBContent_C%2FUsersArticlePage&c=1176156731381.

³⁹ See Gabriel Roeder Smith & Co. “Potential Effects of the GASB’s Preliminary Views.” Research Memorandum. August 30, 2010.

addressed through the structure of the new plan. The State of Utah shifted to a hybrid defined-benefit/defined-contribution approach by creating a new tier within the *existing* DB program under which newly hired employees would be subject to different pension rules. Under the new plan, employees could choose a defined-contribution or a defined-benefit pension. However, the government's costs are limited to 10 percent of employee payroll; if costs rise above that level, employees must contribute the difference. Under such an approach, said the Utah Retirement System's actuaries, the plan "would continue the current practice of computing the amortization of the UAAL as an increasing amount

(level percentage of payroll), because all members continue in the defined-benefit plan, albeit future hires would have a smaller benefit than current members."⁴⁰

This approach would effectively eliminate most of the so-called "transition costs" involved with a DB-to-DC shift.

Put simply, the supposed higher costs of DC plans are mostly a function of the fact that DB plans have not fully funded themselves as they should. Under current accounting rules, shifting to a DC plan would force DB plans to finance their remaining unfunded liabilities over a shorter period, one which more closely resembles what private-sector DB plans are required to do. Whatever budgetary problems these may present, they are not the result of DC pensions being more costly than DB plans. Moreover, creative plan structuring can address most

transition costs even in the short term.

Attracting and Retaining Employees

It is sometimes argued that without defined-benefit pensions it would be more difficult for government to attract and retain quality employees. The PERS Segal study states, "Only a DB plan can be structured to attract and retain employees for a productive career, and to incent employees to retire when it suits the employer." This is true – but the incentives presented under PERS and other public-sector DB pensions generate incentives that are perverse, to say the least.

Defined-benefit pensions — however generous they may be — present incentives that can interfere with employee attraction and retention. Under a DB plan, the value of benefits accrued in a given year increases with the tenure of the employee. Since benefits are based upon final earnings, in any given year the employee not only earns an additional year of benefits, but his rising wage re-values the benefits he has earned in the past. Podgursky and Costrell show using public school teacher pensions that the typical

For potential hires who may wish to remain in public employment for only a decade or so, a DB pension is a clear money-loser.

⁴⁰ Gabriel Roeder Smith & Co. "Information Requested by Committee for Nov. 12th Meeting." Memorandum to Sen. Daniel Liljenquist, Utah State Senate. November 10, 2009.

participant is “under water” until his late 40s, meaning that he has contributed more to the program than the benefits he has yet accrued.⁴¹ Such an individual could leave literally hundreds of thousands of dollars on the table by leaving public employment. Beginning around 50, pension wealth net of contributions rises rapidly through around age 55, but then declines and by age 60 has become negative. Those who remain in public employment past age 60 pay a significant “tax.”

How does this affect the ability to attract and retain *quality* employees? For potential hires who may wish to remain in public employment for only a decade or so, a DB pension is a clear money-loser. These individuals, who often are the most able and ambitious, would far prefer a DC pension plan. So DB plans are not optimal for attracting the kinds of employees a modern establishment desires. What about retention? It is clear that DB pensions offer powerful incentives to remain in public employment once the individual has attained a decade or so of tenure, but this often serves to prevent employees who want and should leave from doing so. The burned-out teacher or the physically ailing public safety officer might prefer to shift to a different job and the public might be served by them doing so. But the cost to leaving public employment at, say, age 40 can range from around \$200,000 to over \$500,000 in Podgursky and Costrell’s calculations. Finally, employers might wish to convince their most able employees to delay retirement, but there is a significant employee cost to doing so. Using the Missouri teachers pension plan, Podgursky and Costrell show that an employee who delayed retirement from age 60 to 65 would give up over \$150,000 in pension wealth.

Moreover, it is not clear how much public employees truly value their pension benefits. Research published at the Stanford Institute for Economic Policy Research showed that Illinois school teachers value additional pension benefits at only around 17 cents on the dollar. That is, given the opportunity to purchase additional benefits at extremely favorable rates, even using loans provided by their employer, many teachers choose not to, indicating that they were effectively saturated with retirement benefits relative to other forms of compensation.⁴² Public-sector pension benefits generally are quite generous even compared to the combination of Social Security and DC plans offered in the private sector. This raises the possibility that a reduced pension benefit, coupled with modest salary increases, could both be acceptable to public employees and save money for government employers and taxpayers.

DB plans are not optimal for attracting the kinds of employees a modern establishment desires.

⁴¹ Costrell, Robert M. and Michael Podgursky. “Golden Handcuffs.” *Education Next*. Winter 2010 / Vol. 10, No. 1.

⁴² Fitzpatrick, Maria D. “How Much Do Public School Teachers Value Their Retirement Benefits?” Stanford Institute for Economic Policy Research, Stanford University. November 15, 2010.

Cash Balance Plans

An approach that mimics some of the attributes of both defined-contribution and defined-benefit plans is the so-called cash balance plan. Under a CB plan, benefits are based entirely upon contributions made to an account by employees and employers. However, like a DB plan, the contributions receive a guaranteed rate of return rather than being subject to the ups and downs of the market. States like Nebraska utilize a cash balance plan for at least some of their public employees. CB plans avoid the incentive problems associated with DB plans.

CB plans also offer greater transparency than DB plans. In Nebraska, for instance, participants are guaranteed a 5 percent annual return on their account holdings, though returns may be higher in good times. This promise implies a significant subsidy from the government, since the plan sponsor cannot invest to generate 5 percent returns without taking risk. Nevertheless, under a CB plan this subsidy is made clearer. And compared to the effective 8 percent average return guaranteed under the typical public-sector DB plan, the subsidies under CB plans are more manageable — even if DB plans should be made fully transparent.

Transparency and Advocacy at PERS

Public-sector pension reform is an active and important policy discussion in states across the country. It is important that lawmakers and the public receive adequate and accurate information regarding public pensions. The plans themselves can and should serve as a source for such information. However, in many states — including Nevada — pension-program officials have taken an advocacy position in defense of the plans they administer and have gone on the attack against reform proposals advocating a shift to DC pensions.

Across the country, public-pension managers have begun a concerted effort to push back against the view that pensions are dangerously underfunded or that pension benefits for public employees are excessively generous. Nevada PERS has been a leader in this regard, both writing responses to critics under its own name, as well as commissioning studies designed to discredit plans to shift to DC-style pensions. Where warranted, PERS is both within its rights and acting in the public interest to correct erroneous information regarding public-sector pensions.

However, PERS also has an obligation to ensure that its publications are aimed at informing rather than advocating. For instance, PERS has published a cookie-cutter study similar to that of other state pensions titled “The Economic Impact of Nevada PERS.” This study claims, for instance, that “Each dollar in taxpayer contributions to Nevada PERS

supported \$6.21 in total economic output in Nevada.” Likewise, the report claims that PERS benefits created over 5,000 jobs in Nevada, due to the “multiplier effect” when those benefits are spent in the Nevada economy.

These conclusions assume, illogically, that taxpayer funds paid into PERS would otherwise disappear and not be spent elsewhere, and that PERS assets would likewise disappear instead of being held by others in the economy. In other words, while there may be a multiplier effect to the funds paid out by PERS, there is a negative multiplier effect generated by the taxpayer money that must be paid into the program. This report also excludes the large contingent liability that PERS places on Nevada taxpayers, a liability that is likely to come due at the worst possible time.

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While citizens should judge for themselves the appropriateness of the advocacy, it is ironic that a concerned citizen wishing to gather more information on PERS would nowhere on its website find links to the plan’s Comprehensive Annual Financial Report or actuarial valuations of the plan’s finances, reports which are available on the websites of most state pension plans. (This writer obtained a copy of the CAFR only by e-mailing PERS.) Visitors to the PERS website will find, however, links to numerous documents advocating for the DB plan and seeking to debunk criticisms of it. In a sense, PERS’ sins of omission are greater than its sins of commission. Issue advocacy is optional; transparency should be mandatory.

Conclusions

Nevada PERS is far from the worst-funded or worst-managed public-sector pension system in the country. PERS and Nevada government have often done better than many other states in making contributions on time and in full. However, this merely highlights the worrying state of public-pension financing around the nation. Using market-valuation methods — which are consistent with economic theory, the practice of financial markets and the rules under which private-sector pensions must operate and which have recently been endorsed by the Congressional Budget Office — PERS is very poorly funded.

If we accurately gauge the true value of PERS’ assets and liabilities, the plan is only around 34 percent funded and faces unfunded liabilities of almost \$41 billion.

It is only with a fair market valuation of pension obligations that we can understand the size of the problem and the approaches that will — and will not — solve it.

The Nevada Policy Research Institute

is an independent research and educational organization dedicated to improving the quality of life for all residents of the Silver State through sound, free-market solutions to state and local policy questions. The Institute assists policy makers, scholars, business people, the media and the public by providing non-partisan analysis of Nevada issues and by broadening the debate on questions that for many years have been dominated by the belief that government intervention should be the default solution.

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November 2011