

# Staying Afloat in a Sea of Pension Numbers

**Dean Michael Mead, Marcia Van Wagner, and Donald J. Boyd\***

*Recent years have witnessed a spate of new numbers, some of them contradictory, about the funding status of state and local government pension plans. Why do pension plans look better funded according to some numbers and worse according to others? Rather than being more or less accurate than one another, each set of numbers emphasizes different aspects of pension finances with potential value to analysts. This article explains how pension numbers are calculated by financial economists and rating agencies, under the old as well as the new pension accounting standards, and it highlights the valuable insights that can be gleaned from each.*

## **INTRODUCTION: DEAN MICHAEL MEAD**

**A**n appropriate subtitle for the topic of pensions, in terms of questions for governments, might be: Is there an exit to get out of the obligations that they are facing? The issue of pensions and retiree health insurance has always been foremost among the concerns of people who are interested in government finance—public finance—but it has obviously taken on an entirely new dimension over the last five or six years with the recession and the impact the recession had on the funded status of pension plans. In the public sector, there was renewed emphasis on the affordability of pensions and other post-employment benefits (OPEBs), and this emphasis was probably highlighted by the fact that while all this was going on, the Governmental Accounting Standards Board (GASB) happened to be working on updating its standards for accounting and financial reporting of pension benefits. The fact that both of these events happened at the same time was coincidental; the standards update was a

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project the GASB had started in 2006, and then 2008 rolled around and all of a sudden, we were getting a lot more attention on that project than we had ever imagined we would.

This discussion will try to sort out the sea of pension numbers that are floating in front of us, that in many cases tend to disagree with one another and make it difficult to determine which set of numbers we ought to be considering when we are examining governments' pension obligations, trying to get a sense of whether their pension plans are healthy or unhealthy and what it is going to take for governments to fulfill the obligations they have made for pensions for their employees. Having several sets of numbers now increased by one, as governments start to implement the new GASB pension standards, can lead to a considerable amount of confusion.

We are going to discuss what these main sets of numbers are that are out there: funding numbers, the numbers that Moody's has been publishing, the numbers that financial economists like Joshua Rauh and Alicia Munnell and others have been publishing, and then what the new numbers are going to look like under the new GASB accounting rules.

I will begin the discussion by reviewing funding information, then turn to Marcia Van Wagner, from Moody's, who will explain what Moody's credit rating approach is and what its numbers mean, and then finish with Don Boyd, from the Rockefeller Institute, who will discuss the financial economics approach to calculating information about pensions. I will wrap up the discussion by talking about the GASB's new pension numbers. We will not be trying to help you determine which the right numbers are. There are no right numbers; there are numbers that are right for what your concerns are. Each of these groups of numbers speaks to different aspects of the issue of pensions and the obligations that governments face, and I hope you will have at the end of this discussion a better appreciation for how these numbers differ from one another and what each of them is trying to explain to you.

Let me begin by stating that most of the time when you are seeing pension numbers, they are numbers that are based at some point, at least initially, on an actuarial valuation, and I will apologize, as I usually do when I discuss pensions: I am going to dumb down actuarial science so that I can actually explain it, and I understand that it is far more complicated than this.

## **The Calculation of Key Pension Measures**

Essentially, we are talking about three steps, and it is in these three steps where the differences in the numbers lie:

1. Cash flows for pension benefits are projected out into the future based upon the terms of the plan;

2. The projected cash flow numbers are then discounted to their present value; and
3. The present value is then allocated to past periods of service and future periods of service.

What is allocated to the past—what has actually been earned already—is the basis for the pension liability numbers that we see. That is what is known now as the actuarial accrued liability (AAL), and it is from that point that the variations take place, that the adjustments by Moody’s are made, and that the adjustments by the financial economists are made; it is making different assumptions, taking different approaches, to each of these parts of the measurement process for determining how big that pension liability is.

The most common piece of information that is bandied about, that is not just appearing in academic journals or in the *Bond Buyer*, but is in the *Sacramento Bee* and the *Journal-News* and the *Stamford Hour*—lots of small papers that don’t generally cover public finance issues—is the funding ratio. And that number is the one that is most confusing, because depending upon whose numbers you are looking at, a government may look relatively healthy or extraordinarily unhealthy in terms of its pension benefits.

## The Funding Approach

Let me start by discussing the funding approach. The existing pension standards, the ones that are about to be superseded starting on July 1 by GASB Statement 27, were created in a very different environment. (Editor’s note: The panel on which this article is based was presented on May 7, 2014, two months before the implementation of the new GASB accounting standards.) The extent to which governments can be said to take a reasonable approach to funding their pensions is based in part on the fact that what the GASB established as accounting standards was embraced as a benchmark, or “gold standard,” for funding policy. That is in part because the standards themselves were focused on the ways in which governments were generally approaching the funding of their pension standards, and I call this a “funding-based” approach. Some people call it a “funding-friendly” approach, because in their view, the information that governments were reporting could be affected by the approach that they took to funding. If they took a less aggressive approach, it did not necessarily result in their being penalized in the information they were reporting, because much of the measurement of the pension liability was based upon how they approached funding their contributions to the pension plan.

Future cash benefit payments are projected based upon the terms of the plan as of the point when the measurement is being done; it includes

assumptions that are based on the people who are actually covered by the plan, or at least they are supposed to be.

The discounting of projected benefit payments is based on the long-term expected rate of return. This number has probably received the most attention in the discussion of how the pension liability is measured, although it is not the most significant issue in terms of the assumptions. It is certainly the one that has received the most attention, however, because it is conflated with people's concerns about the reasonableness of pension plans' assumptions about their returns. People who are concerned that pension plans are assuming a rate of return that is unrealistically high worry about the accounting standards requirement, which says that the discount rate ought to be based on that long-term expected rate of return (LTEROR), although to be clear, there is nothing in the pension standards that says it is okay to assume a rate of return that is not realistic. There is nothing in the existing standards, or in the new standards, that says you can do that. That is the kind of thing that should be policed by the actuary and by the auditor of the government and should not happen. In fact, in many cases, the assumed rates of return are not as unrealistic as many people say.

Once you have that present value (PV) of the future benefit payments, which is allocated to past and future periods of service, the existing standards allow for six different cost allocation methods. Each of these methods can be applied as a level percentage of payroll or a level dollar amount—which really means there are 12 options—and if there is anything that bond analysts have said causes them more concern about the lack of comparability in pension numbers that are calculated under the existing accounting standards, it is that. Not surprisingly, and I will mention this later when I discuss the new accounting standards, that is one of the first areas that the board attacked, because that is a source of significant disparity in terms of the comparability of pension information.

### **Key Funding Approach Measures**

The key pieces of information that come out of the funding approach and the existing accounting standards are (1) the actuarial accrued liability (AAL), that portion of the present value of future benefits that is allocated to past periods of service, (2) the actuarial value of assets (AVA), which is a smoothed value—it is not the market value of the resources in the plan, but a value that represents a smoothing in of annual changes in fair value, generally over a three- to five-year period—and (3) the unfunded actuarial accrued liability (UAAL) or just plain old unfunded liability, which is the difference between the AAL and the AVA.

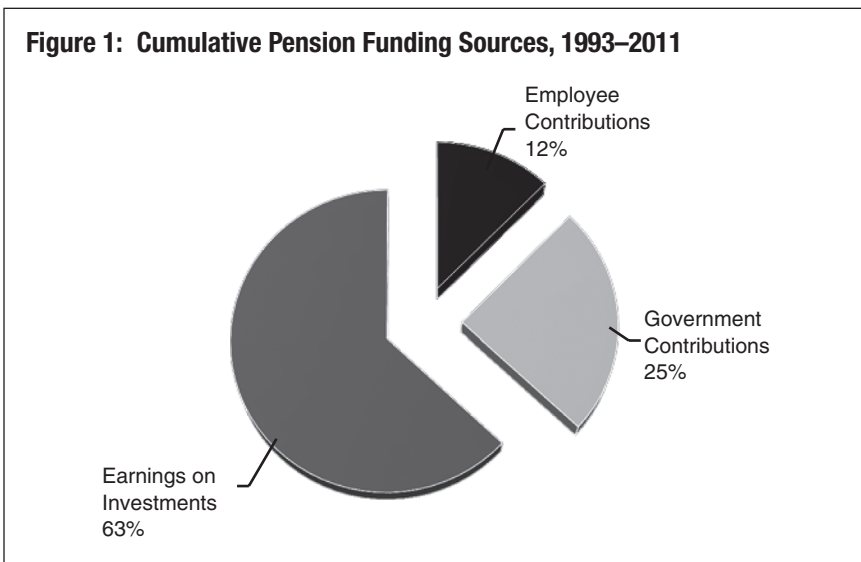
The annual required contribution (ARC) was not intended to be the gold standard for funding or the funding target that it has become. It was intended to be the measure of pension expense, or the cost of pensions that governments would report each year. It has over time been adopted and treated, however, as the target that every government should be aiming to meet. It has two pieces, one is the normal cost, or the service cost, which is the value of benefits that are newly earned during the year, and then a portion of that unfunded liability, which is amortized over 30 years, so simplistically, one-thirtieth of the unfunded liability; you put those two together and that is the ARC. That is what many governments, if not the vast majority of governments, base their contributions on; they are looking to contribute the ARC. To the extent that a government has not been contributing the ARC, it accumulates a liability on the face of the financial statements called the net pension obligation (NPO), which is just the cumulative underfunding of the plan since the date that the government implemented these pension standards in the late 1990s.

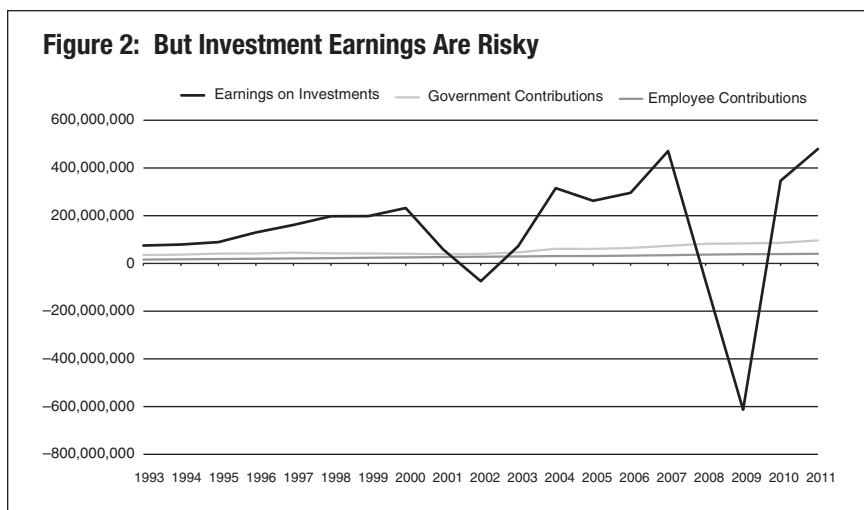
### **The Value of Funding-Based Measures**

So what is the good of these numbers, which are not going away just because governments are going to adopt new standards for accounting and financial reporting in their audited financial statements? Governments by and large are going to continue to fund if they are funding based upon an actuarially determined contribution amount like the ARC. There may be some governments that started funding that way because of the accounting standards, but certainly major groups within the industry such as the Government Finance Officers Association (GFOA), the National Association of State Auditors, Controllers and Treasurers (NASACT), and others have been encouraging their members to continue to approach funding in the way they have before, in a manner that is responsible and is going to bring them to full funding at some point. So this information is still going to be there to a certain extent. Some of it may still be in the audited financial reports. So in terms of evaluating their funding policy, their approach to putting money aside in the trust for the plan, this information is still quite relevant, and we are still going to want to look at it. The ARC is a flawed measure, and depending upon how it is calculated, it may be a number that will never get a government to full funding, and that is a conversation on which I could spend much more time. Regardless of its flaws, however, the ARC has been put out there as a benchmark, as a widely accepted standard for contributions, and it will still be there and still be something that governments will use and that analysts will use to assess whether a government is or is not doing a reasonable job of funding. So that is the gist of the funding approach.

## MOODY'S ADJUSTED NET PENSION LIABILITIES: MARCIA VAN WAGNER

Net pension liabilities are obviously a very important issue to people, and when Moody's put together its proposed pension adjustments, we received a lot of feedback about multiple numbers being out there. Not everybody was happy with what Moody's was doing, but we felt very strongly that the GASB accounting approach to reporting pension liabilities did not answer the question that we wanted answered, and that was how much, ultimately, do you have to pay out in pension benefits? That is part one of the question. Part two of the question is how are you going to pay for it? The current standards seem to go quickly to part two and don't really give us the answer to part one, so we wanted to make some adjustments to give us a better idea of what the ultimate liability for governments was. Government pension valuation is bound up with pension funding sources and expectations of investment returns (Figure 1), and what governments have been interested in is how much they are going to have to contribute in the future. What we really want to know is how much do you owe in the future, and then again, how are you going to pay for it, given that the big chunk of what you are relying on, which is the investment returns, is a very volatile source of revenue (Figure 2). And we felt that this approach conflates or muddles up assets and liabilities, because you are taking a future liability, which is what you owe for pension benefits, and kind of haircutting it for what you think your assets are going to be doing in the future.





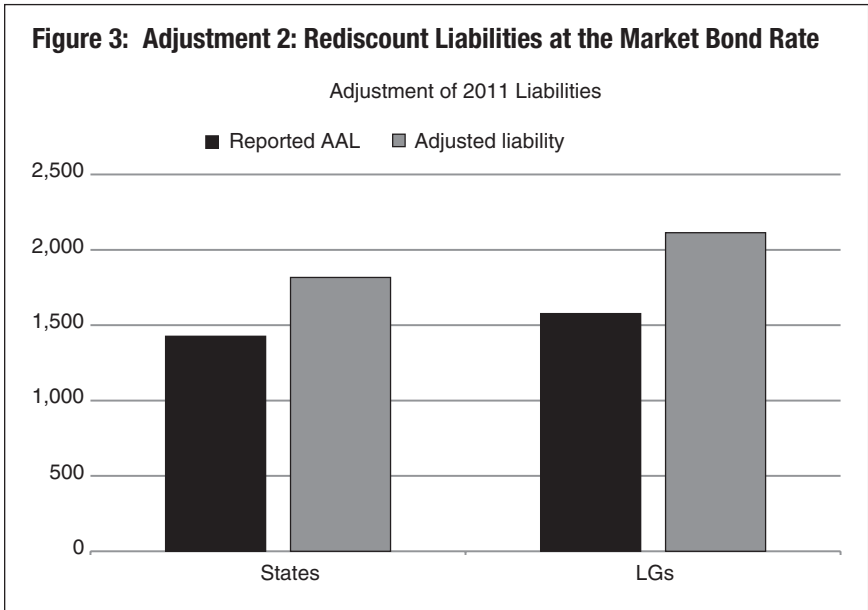
Again, it does not give a clear balance sheet picture of what you owe, what this liability really is, and it is a liability that is a fairly firm liability, for the most part, contractually protected. Benefits to employees, we feel, have a sort of bond-like level of obligation for governments. And as Dean mentions, there are a number of other assumptions that we also view as limiting the comparability. One of the things we do, of course, when we are rating bonds, is to compare different issuers, and we need to have clearer comparisons than we were afforded by the reported number. There are cost-sharing plans; the way those have been reported, it is not clear where the liability actually lies; and there are all of these other assumptions that Dean has already mentioned. We have two pieces of fruit, at least feeling that they are both fruit; we think that our adjustments have now gotten these pension liabilities to where maybe we are comparing apples and oranges instead of apples and trucks. So I am going to quickly run through these adjustments.

### Moody's Adjustments

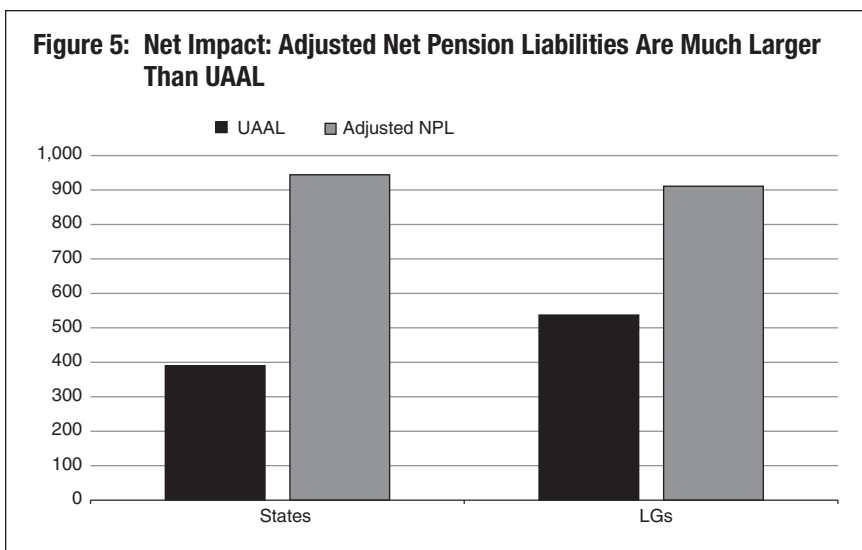
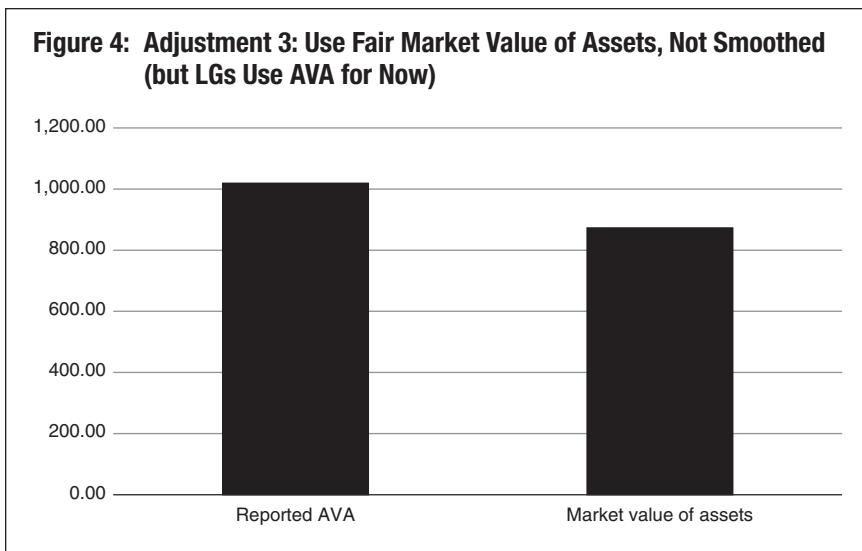
The first thing that Moody's did was to allocate cost-sharing liabilities among the various participating employers in a pension plan, based on the pro rata contributions of those employers to the plan. That distributes liabilities among states, local governments, sometimes component units, universities, and so forth and gives us a much clearer picture. For example, in the case of Ohio, if you look at their reported pension liabilities in the state comprehensive annual financial report (CAFR), it is quite significant that once you do this cost-sharing allocation, you see that the state's liability is actually quite small, and the liability they are reporting really belongs to local governments in the state.

The second thing we did was to rediscount the liabilities using a corporate bond market rate of interest, and this is not because we necessarily are taking issue with the assumptions about returns, but rather because we want a market measure of what those liabilities are. This gives us the market measure, and Figure 3 shows you the impact of that rediscounting for states on the left set of bars, and for local governments on the right set of bars. So, again, why are we using the bond market rate? Aside from just wanting a market measure, we also have many issuers that report on a Financial Accounting Standards Board (FASB) basis, and the FASB already uses this approach. FASB accounting for pension liabilities discounts the liabilities using a corporate taxable bond rate. We are treating the pension obligations as a bond-like obligation; we are measuring them independently of asset performance and asset mix.

The third adjustment we made is that we are using the fair market value of assets, rather than a smoothed value, and Figure 4 shows, on the left, the reported actuarial value of assets (AVA), the smoothed value of assets, and ours on the right is showing the actual market value. So that gives us a point-in-time measure of what the asset values are, rather than an averaged amount of assets. When you put these three adjustments together, the cost-sharing liability allocation, the discount rate, and the fair market value of assets, we get a much different measure of the pension liabilities. Figure 5 shows, on the left, the pension liabilities. The black bar is the reported, unfunded actuarial liabilities for states, the gray bar is Moody's adjusted liabilities for states, and on the right side is the same comparison for local governments.







The fourth adjustment we made was to determine how, given this new measurement of liability, you would fund it. If you were treating this as a bond, and amortizing it over 20 years at a fixed-level dollar amount, how much would that cost? We have a sort of adjusted amortization of these net pension liabilities. It is not a funding number; it is a metric to put every pension system we look at on a common basis in terms of how those pension liabilities can be amortized.

We are looking forward to improvements in disclosure when the new GASB regulations or standards are implemented. We think that we will be able to

refine some of these estimates and get better, more accurate comparability among our different issuers. We are especially looking forward to seeing what governments report as their version of what the allocation of cost-sharing liabilities is. The duration, which gives us the basis for discounting liabilities, is now going to be reported, and we expect that is going to help—we use one duration for everybody, because we don't have better information than that. We will be getting individual durations for different pension plans and that is going to give us a lot more, finer detail to make our adjustments. In addition, some of the components of pension expense, the normal cost in particular, will be more readily disclosed under the new standards.

So what is the meaning of the new GASB standards for Moody's pension analysis? Well, it is not a lot. We are looking forward to getting more detail, but we have already made these adjustments. We don't think that the new GASB standards are going to affect our ratings analysis. We still will have to do an adjustment for the discount rate, because the new standards continue to use a discount rate that is based on investment rates of return, which again goes back to our feeling that it doesn't answer the right question for us.

### **Some Findings**

So what do we find with our adjustments? First of all, net pension obligations are a lot bigger than debt outstanding. In Figure 6, the gray bar is, again, pension obligations; we show states on the left and local governments on the right. The black bar is debt. The middle bar in each set is reported unfunded liabilities. The comparison is quite significantly higher for states and somewhat higher for local governments. Figure 7 shows the information in a different way. The points above the diagonal line are the states and local governments for which our adjusted net pension liability is greater than debt; it is particularly prevalent among states. Figure 8 gives a sense of the range of net pension liability; this is a ratio of net adjusted net pension liability to state revenues. Illinois, at the top, has net pension liabilities that are basically two and a half times annual revenues; Nebraska, at the bottom, has a net pension liability of less than 10% of revenues. Figure 9 gives information that is independent of our net pension liability adjustment; it shows, under the current measurement, what annual contributions should be; many governments do not make their full pension contributions, and this chart shows local governments. The black portion of the line is what those municipalities actually contributed to their pension plans, and the gray line, or the combined black and gray line, is the amount that they should have contributed according to the ARC. Chicago, at the top, contributed roughly one-third of its required contribution. Some of these localities did a better job in terms of funding their pension plans, but clearly not everyone is stepping up and funding according to what the guidelines are.

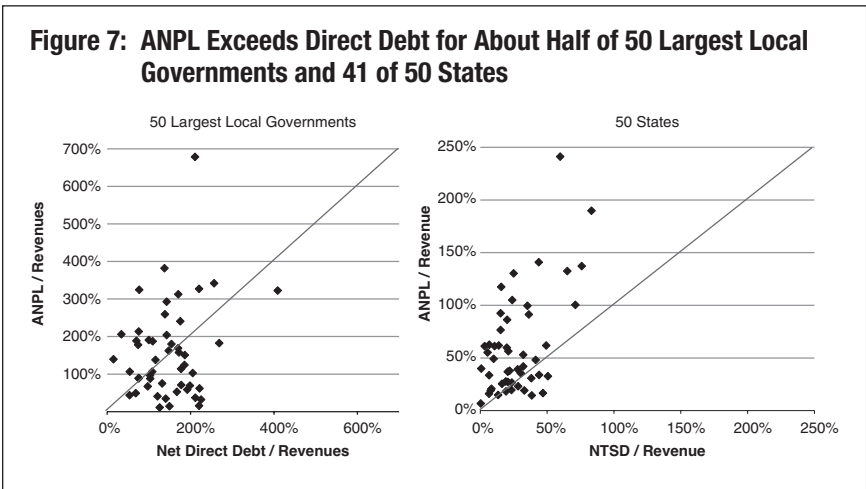
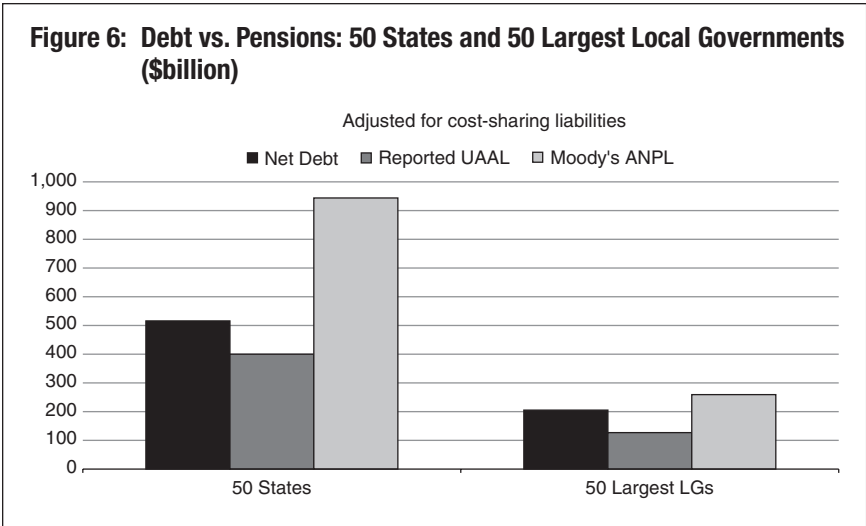
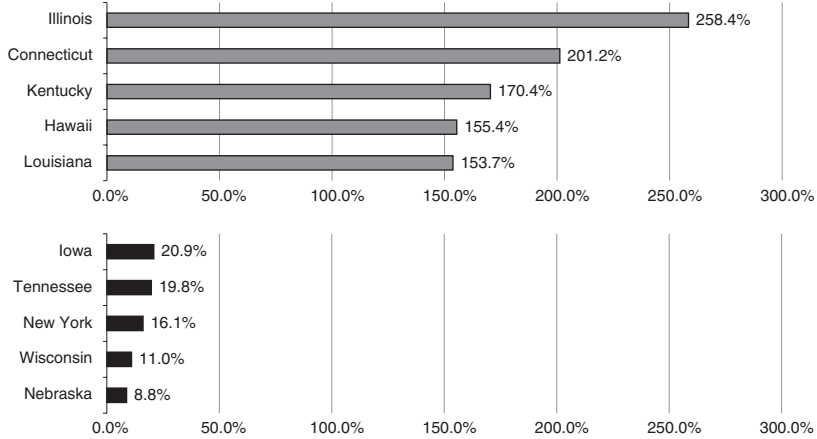
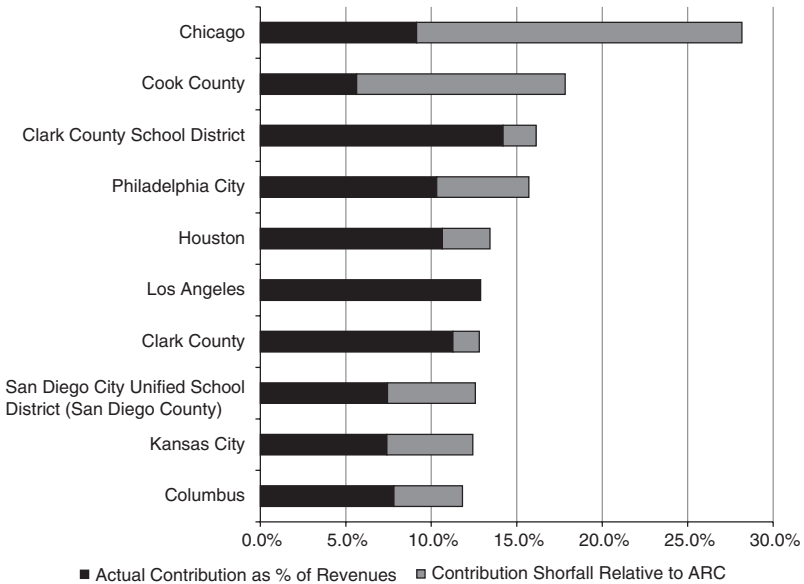


Figure 10 also gives us a way of looking at the future a little bit, or at least the near future. We are able to interpret current market trends and take a view on what those are going to mean for near-term pension liabilities. We think that for 2013, for example, for which we are starting to see the financial reporting, we had strong pension investment returns, and interest rate trends during the year have been mostly up as well. And those two elements are going to push down pension liabilities, the combination of higher returns and higher discount rates, according to our measure of pension liabilities (see Figure 11). And let me just illustrate that with Illinois, which in the fall of 2013 put out, as part of its pension reforms, a

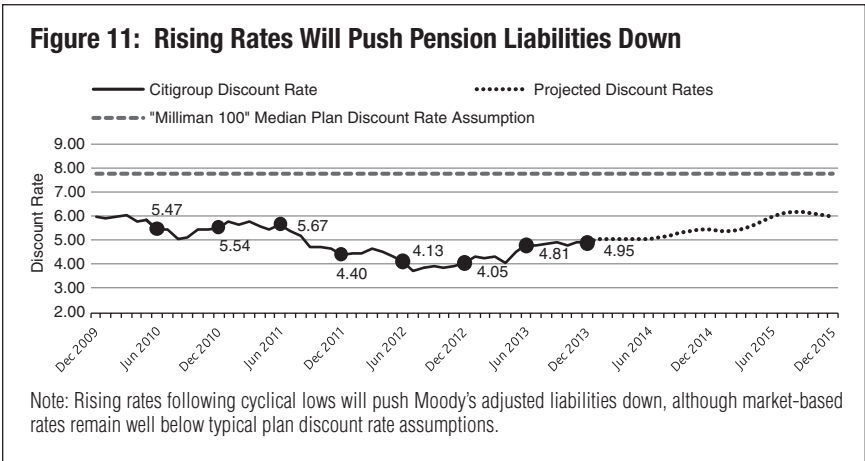
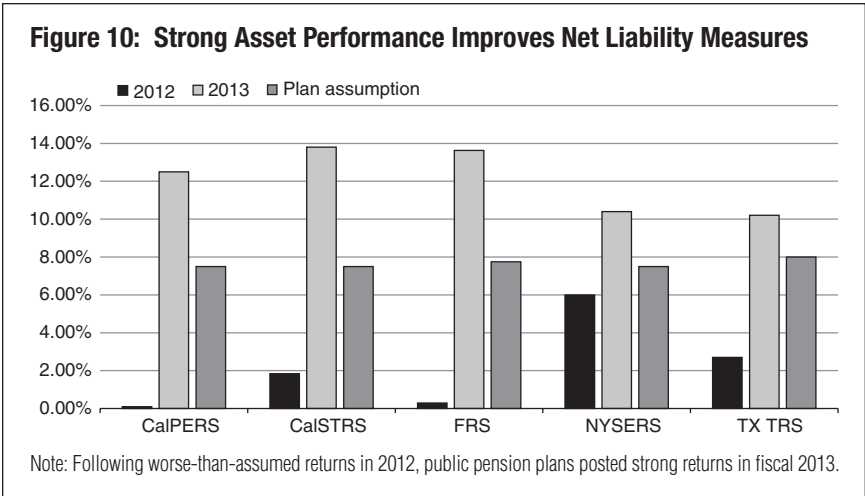
**Figure 8: Highest and Lowest Ratios of Three-Year Average ANPL to 2012 State Revenues (% of All Governmental Revenues)**



**Figure 9: Many Governments' Pension Contributions Fall Short (Even Before Considering Impact of Adjustments)**



press release saying that its 2013 pension liabilities, or UAAL, had deteriorated. We took the opposite view; we took the view that the 2013 results for Illinois had improved, because we were measuring its results based on 2013 returns and 2013 discount rates, and not a lagging of the asset performance over a period of years.



### Rating Impacts

We have incorporated pensions into our local and state general obligation scorecards and our methodology, and the scorecards for both state and local governments show that we treat debt and pension liabilities equally; we weight them equally in our scorecard (see Tables 1 and 2). They are not equal on a dollar-for-dollar basis, but they are equal on a factor basis. Pensions have been a key driver in several high-profile downgrades, e.g., Connecticut, Hawaii, Illinois, Kentucky, New Jersey, Pennsylvania, Puerto Rico. Most, I think all of these downgrades, were undertaken prior to our finalizing our adjustments. We had a lot of information, even without doing the adjustments, about these states, but for local governments, once we made these adjustments, it revealed a lot about local governments that

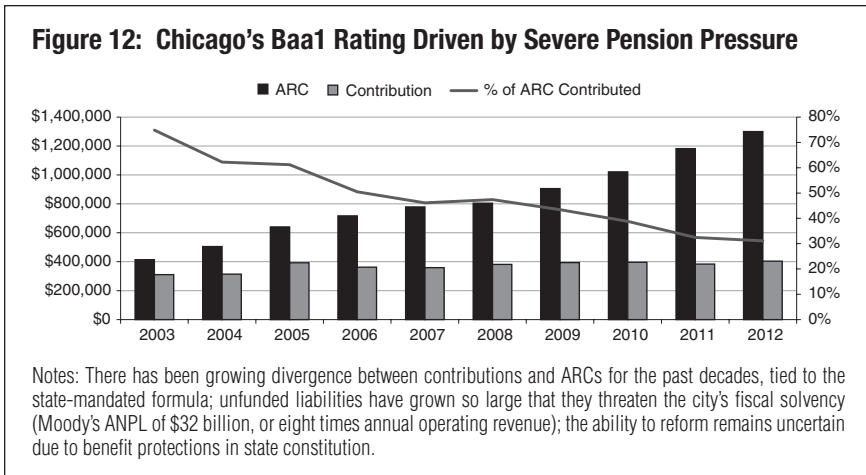
**Table 1: Local Government Rating Methodology “Scorecard” Debt and Pension Metrics Have Equal Weighting**

	Very Strong	Strong	Moderate	Weak	Poor	Very Poor	
	Aaa	Aa	A	Baa	Ba	≤ B	Weight
<b>Debt/Pensions (20%)</b>							
Net direct debt/full value	< 0.75%	0.75% ≤ n < 1.75%	1.75% ≤ n < 4%	4% ≤ n < 10%	10% ≤ n < 15%	> 15%	5%
Net direct debt/operating revenues	< 0.33x	0.33x ≤ n < 0.67x	0.67x ≤ n < 3x	3x ≤ n < 5x	5.00x ≤ n < 7.00x	> 7.00x	5%
Three-year average of Moody’s adjusted net pension liability/full value	< 0.9%	0.9% ≤ n < 2.1%	2.1% ≤ n < 4.8%	4.8% ≤ n < 12%	12% ≤ n < 18%	> 18%	5%
Three-year average of Moody’s adjusted net pension liability/operating revenues	< 0.4x	0.4x ≤ n < 0.8x	0.8x ≤ n < 3.6x	3.6x ≤ n < 6x	6x ≤ n < 8.4x	> 8.4x	5%
Notes: Three-year average is used to smooth the volatility inherent in the ANPL metric. Debt breakpoints are more restrictive than pensions, reflecting the fixed nature of debt obligations; pension measures are estimates, may be volatile across years, and can be renegotiated in some cases and reduced. Pension contributions and requirements are also considered: Have ARCs been paid? Is a cost-sharing plan receiving adequate employer contributions to keep up with actuarial requirements? Is the amortization method heavily back-loaded?							

**Table 2: State Rating Methodology “Scorecard” Debt and Pension Metrics Also Weighted Equally**

Subfactor	Measurement	Aaa	Aa1	Aa2	Aa3	A	≤ Baa
Debt (10% weight)	Net tax-supported debt/total governmental fund revenues	< 15%	15%–30%	30%–50%	50%–90%	90%–130%	> 130%
Pension (10% weight)	Three-year average adjusted net pension liability/total governmental fund revenues	< 25%	25%–40%	40%–80%	80%–120%	120%–180%	> 180%
Notes: Distinct metrics and breakpoints reflect our analytical view that pensions are “debt-like” but not the same as bonded debt; ARC funding trend, reform measures, and other qualitative factors have also been considered in the analysis.							

was not immediately evident from financial reports. We put 29 outliers under review; of those, we downgraded 18, including Chicago, Cincinnati, and Minneapolis, as a result of the new pension methodology. I think we may have downgraded more since then, due mostly to pension liabilities as well. The Chicago downgrade was driven by severe pension pressure;



Chicago has not been funding its pensions, and the pensions have become a formidable challenge for the city. Our measured net pension liability for Chicago is \$32 billion, eight times annual operating revenue. It is clearly very challenging for the city to face that, and Figure 12 shows that the historical contributions to the pension system versus the required contribution have deteriorated over time as well.

### Benefits of Moody's Adjustments

What are the benefits of Moody's pension adjustments? First, they allowed us to identify the cost-sharing risks ahead of the implementation of new GASB standards. Second, they enabled a standardized approach for better credit comparability. Third, they enabled us to compare pension liabilities to debt outstanding. Fourth, they enabled us to develop a balance sheet approach guided by the market valuation of present value of future benefits. Fifth, they have provided a forward-looking evaluation of pension burdens. Sixth, they have identified outliers within rating categories. Finally, the implementation of the new GASB standards is unlikely to affect our ratings.

### RISK AND SIGNALS: DONALD BOYD

I am going to discuss risk and signals. I think that some of the important differences among the ways of measuring these numbers are what they convey about risk, particularly investment risk, and the signals they send to the actors involved in making pension decisions, particularly pension benefit decisions. I want to start out with the caution that words matter. The words that are used in many of these conversations are often misused

or misinterpreted: a discount rate and a long-term expected rate of return are not the same thing conceptually. Economists often make the distinction, but I think it is often stated otherwise. The discount rate, in concept, is used for measuring economic liability for discounting cash flows to the present. Expected return, in concept, is used to determine assets and contributions needed. So when Dean talks about a funding-based approach, that is what he is talking about; it is related to what you think you might earn on assets. In practice, for U.S. public pension plans, they have traditionally been the same thing—that is, not only do funds use an expected rate of return to determine how they plan to fund their liabilities, but they also use an expected rate of return to discount liabilities. That is not generally true elsewhere.

So, here is a quick quiz: If I owe my brother-in-law Bill \$1,000 a year for the next 30 years, does my liability to him depend on how I invest my assets? No, of course not, and that is why you need a discount rate. However, if I am trying to figure out the amount of assets I need to set aside, will that depend upon how I invest my assets? The answer is yes, and you need an earnings assumption for this. They could be the same thing, but they need not be the same thing. So if you were to take these two different concepts and put some numbers on them, that \$1,000 a year for 30 years is a debt of \$17,300 if we discount it at 4%. However, if I am willing to take some investment risk and think I can earn 6% by taking that risk, I might need to set aside only \$13,765. If I think I can reach and invest wisely or luckily and earn 12%, I can set aside \$8,055. That can work if you have a plan for what to do when you don't get your expected return. By and large, there is a plan. That plan is to ask the government for more money if investments fall short.

So, is there a right discount rate to use for coming up with economic liability? Not exactly. However, economists are virtually unanimous in stating that cash flows in general should be discounted using rates that reflect their riskiness. If you apply that concept to pensions, you have to ask yourself, do you intend to pay those pensions? By and large, pensions often—although we have learned, not always—have fairly strong legal protections; they have fairly strong moral protections; they have fairly strong protections in the sense that governments intend to pay them. That leads you to a conclusion that you ought to use a risk-free or fairly low-risk rate to value the liabilities themselves. Once you get into the weeds on this, you will discover many disagreements over the details of what that kind of rate might be, but broadly speaking, the economics profession is in agreement on this, and many different folks are saying the same kinds of things; it is not just one or two people out at Stanford who are saying this. And of course, risk-free rates generally have been lower than earnings assumptions, and much more so in the recent past than long ago.



### Some Discounting Arithmetic

Discounting affects your valuation of liability, and it affects how you might amortize or value annual payments needed to deal with any unfunded liability. Table 1 shows for a given plan with \$100 of assets, that if it is discounted at 8%, we have liabilities of \$100; those same payments discounted at 10% would show \$78, \$79 worth of liability. So that plan would be dramatically overfunded under that assumption. Then way off at the right, I show that discounted at 4%, that plan that was fully funded at 8% turns out to be only 61% funded. This duplicates some of what Marcia said. The point is that it has a huge impact, and it also affects how you amortize any unfunded liability, ranging from being able to take money back, if you will, or underpay under the 10% scenario, up to a substantial amortization payment under the 4% assumption. So it affects both the liability and the amortization of unfunded liabilities. Something that is less discussed is that it also affects the normal cost, how you might evaluate the annual payments required to fund a given set of benefits.

By and large, the salary a mid-career worker earns is going to be paid over the next 20 years, and the benefits might start 20 years down the road and be paid for another 20, 30 years beyond that. The benefits are way off in the future; the salary is relatively close in time. If you rediscount, or you use a different discount rate, a lower discount rate, those far-off benefits are going to get “blown up” much more than the relatively closer salary, and that is going to change how you evaluate the normal cost. Table 2 shows for a reasonable structure of a pension plan that the normal cost calculated using a 4% discount rate is three times as large as the normal cost calculated using an 8% rate. That is a substantial difference. Now imagine you are a financial manager or a mayor negotiating with a labor union, and all you want to do is have the police back on the streets at a funding cost

	<b>Discounted at 10%</b>	<b>Discounted at 8%</b>	<b>Discounted at 6%</b>	<b>Discounted at 4%</b>
Assets	\$100.0	\$100.0	\$100.0	\$100.0
“Liability measure”	\$78.8	\$100.0	\$127.5	\$163.3
Unfunded liability	\$21.2	\$0.0	(\$27.5)	(\$63.3)
Funded ratio	126.9%	100.0%	78.4%	61.2%
INITIAL amortization payment	\$1.9)	\$0.0	\$1.7	\$3.3

Notes: Liability calculation assumes duration of 13 years; amortization assumes 20 years level percent of payroll, with payroll growth at 4%.

**Table 2: Discounting Affects Normal Costs, Too**

Discount Rate	Present Value of:		
	Benefits	Salary	Normal Cost
4%	\$557,497	\$1,800,000	31.0%
6%	\$221,908	\$1,315,142	16.9%
8%	\$92,111	\$1,003,040	9.2%
10%	\$39,724	\$794,971	5.0%
Ratio, 4% to 10%	14.0	2.3	6.2
Ratio, 4% to 8%	6.1	1.8	3.4

Notes: Assumes three-year final-average-salary plan; 1.5% benefit factor; 2% COLA; 4% salary growth; work from 25 to 60; live to 90; initial salary of \$50k.

that is acceptable to you in the near term. Think about what kind of signal this sends—would the mayor rather discount at 8% or 4% if the city has its own city plan? Would the union rather discount at 8% or 4%? And the answer, of course, is that both have essentially the same interest; an interest in a relatively higher discount rate that makes the current cost of funding those benefits relatively lower pushes off the risk to others who may be elected later. So, again, the conclusion from the arithmetic is that liability is, in my example, 63% greater under a 4% rate than under an 8% rate; the amortization is higher; and under a fairly reasonable pension structure, the normal cost is about triple. By the way, the numbers that Marcia discussed did not reflect these higher normal costs—Moody’s doesn’t publish revalued normal costs (that is not the purpose of Marcia’s numbers)—but recognize that the published Moody’s numbers imply higher normal costs as well, and we just talked about the reason for that.

What does risk-free discounting tell us? It tells us how much we owe without considering how we invest, so it is divorced from the question of investment. It tells us the assets we would need to fund liabilities securely, to fund that debt securely, in other words, if we were to invest in risk-free assets; it tells us how much we would need, and it is substantially greater. It also tells us the annual contribution we would need to fund that securely, meaning without needing potentially to call upon the government for even more contributions. And in comparison to the funding approach, the expected rate of return approach, if we compare the two, gives us a sense of the risk that the government or the pension fund is taking on behalf of government stakeholders, how much better they think they can do than the perfectly secure way of funding pensions. So that is what these different numbers tell us, and they send very different signals.

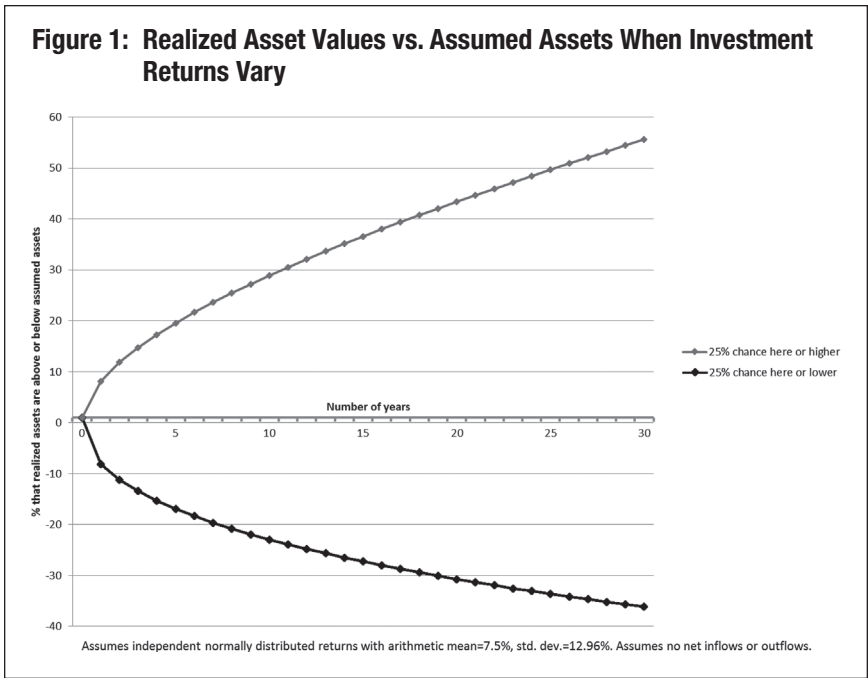
Risk-free discounting does not tell us that pension funds should invest just in risk-free assets; it does not say pension fund assets will only earn a

risk-free return; it does not say that earnings assumptions are too high—they may be, but you cannot get that from this; it does not say how much risk plans, governments, and the public should take or whether they are taking too much risk. These are all important questions, but none of that information comes from these numbers. And risk-free discounting does not say that defined benefit plans cannot work. There are people who advocate risk-free discounting who are saying all of these things, and not one of these statements is implied by risk-free discounting.

Assumed-return discounting tells us how much we need in assets if we get our assumed returns, and how much we must contribute annually if we get our assumed returns; it does not tell us the likelihood that we will get those returns, the magnitude and consequences of not getting them, or how much risk we are taking, although the comparison of the two sets of numbers tells us a little bit about that. It is just a beginning; it does not tell you as analysts or the public anywhere near enough about the risk taken on their behalf. Do we really care about this? “Pension funds are long-term investors; they will get their returns if we just wait long enough. Governments don’t go out of business; they can (usually) ride out the ups and downs.” So do we really care? There are many people actually making this argument. It is not correct, in part because the risk has grown very substantially on average over the last couple of decades.

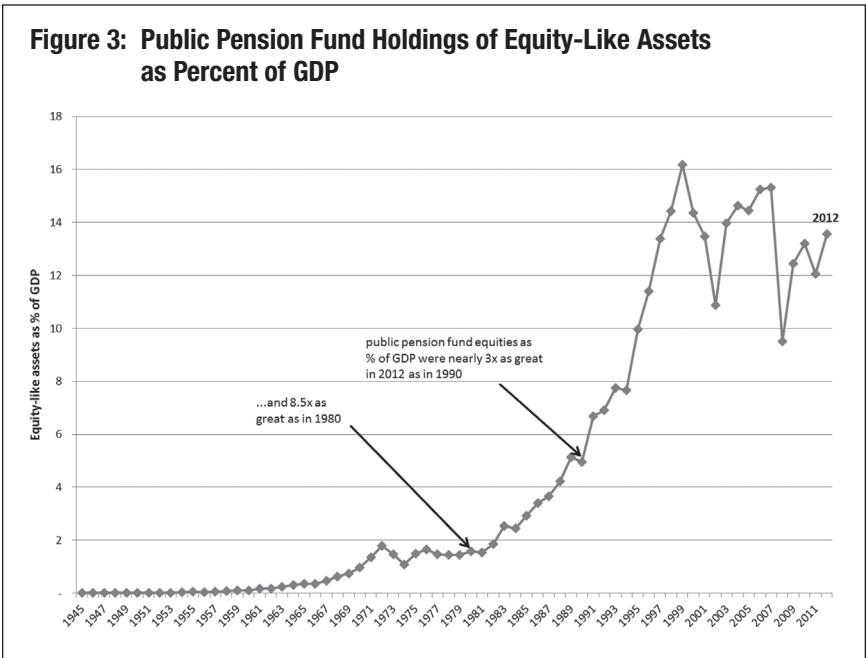
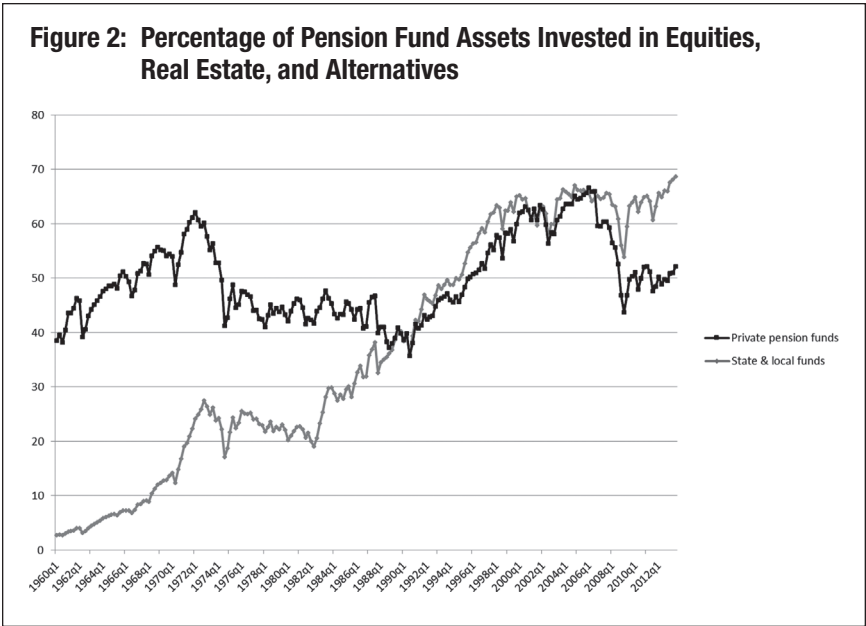
First of all, we now have about \$4 trillion of public pension fund assets under investment in the United States. Just to give a sense of magnitude, CalPERS currently uses, last I checked, a 12.96% standard deviation. Let’s assume that pension funds in the United States as a whole are invested similarly to CalPERS (the largest fund), and let’s use a 12% standard deviation just to make the math easy. If returns are normally distributed, that implies you have a one-sixth chance of at least a \$480 billion shortfall against expected return in a single year. That is, one-sixth of the time, you could do at least that badly. That is greater than all the property taxes collected in the United States in a single year; it is greater than all of Medicaid spending by state and local and federal governments combined. If you amortize that over, say, 30 years, you are in the \$45 billion a year range. That is more than all state and local governments spend every year on fire protection; it is more than half of all highway capital spending. These are big numbers. And, again, my point is that the risk has grown quite substantially over time. If you use a single-year risk number, and if you fall short this year, won’t you just get more next year, right? Well, maybe. Figure 1 shows that if returns are independent from year to year, you don’t expect one year’s return to be influenced by other years’ returns, and that over the long term, the risk actually grows with time. This is something financial analysts know well, so that under an 8% or 7.5% return, roughly, and a 12.96% standard deviation (the CalPERS assumptions), after 10 years, there is roughly a

**Figure 1: Realized Asset Values vs. Assumed Assets When Investment Returns Vary**



25% chance that you will be more than 20% short of your expected value. These risks actually grow with time, unless you think that returns really are substantially mean reverting, and I don't think the academic research suggests that over the long term, there is substantial mean reversion.

Measures do send signals; riskier investments lead to higher assumed returns and lower reported liability, allowing lower contributions now. There is academic research suggesting that public pension plans in the United States have responded and taken on more risk. The risk is real; there are behavioral impacts that are real. I just want to quickly discuss how that has changed over time, because I think it is important to understand that things are different now. As Figure 2 shows, equity-like investments as a share of public pension fund investable assets have increased very substantially over the last 50 years, and are now about two-thirds of public pension fund assets (the gray line)—they had a big downward drop somewhere after 2007, but rose afterward. The black line shows the once much more high-flying private sector pension plans and their investments. So we now have public pension plans that are two-thirds in equity-like investments and actually substantially more so than private plans. We have had this movement toward generally riskier assets at the same time that relative to the economy, public pension plans have grown substantially. You put the two together—equities as a share of GDP—that is what Figure 3 shows over roughly 50 years.



The point is that equities as a share of GDP are now three times what they were in 1990 and about eight times what they were in 1980. So there is considerable risk being taken out there on our behalf, and I think we don't have anywhere near enough disclosure of that risk or its consequences.

I think a starting point is being able to compare funding-based numbers to those that are based on risk-free assumptions, and the next best thing to risk-free assumptions, in my opinion, is looking at the Moody's numbers. Last I checked, Moody's was about \$1 trillion higher in unfunded liabilities than what actuaries report. That gives you some sense of the risk being taken and what public pension funds assume they will gain by their investment strategies. There is a lot more disclosure still needed—we need to go substantially beyond this—but it is a start.

## **THE GASB'S NEW STANDARDS: DEAN MICHAEL MEAD**

For the second half of the presentation, I am going to discuss the new standards that the GASB issued in June 2012 and that governments will begin to implement for the fiscal year starting July 1, 2014. We are maybe a little bit more than a year away from starting to see the new numbers that come out under these new pension standards, which I think you will find address a number of the points that Marcia and Don raised, but not all of them, because the objective here for the GASB was to determine an accounting liability rather than an economic one, and we define an accounting liability as an obligation to sacrifice resources that a government has little or no discretion to avoid. So the measure of the pension liability under the new standards is intended to determine how much in the way of resources a government is going to have to give up in order to fully satisfy the promise it has made for pension benefits. And I think you will see, as you look at the new standards and look at the numbers that come out of them, that there is a much greater emphasis on the assumptions and methods that are used, a tightening of the parameters around which those methods and assumptions can be chosen. We are a bit more prescriptive in GASB Statement 68 than we were in GASB Statement 27, although there still is room for professional judgment because when it comes down to it, each government's pension plan is different. There is a certain amount of uniformity that is imposed by these new standards in a way that will address some of the most significant sources of variability, or lack of comparability, and should make the information a lot more comparable. But the numbers cannot be absolutely comparable because governments have different pension plans that provide different levels of benefits. Their employees are not the same age, and their mortality tables differ depending upon where they are; so what is ultimately calculated as the liability is going to vary because there are inherent differences between governments.

The projection of the benefits, although there has been some tightening of the parameters, is largely and conceptually done the same way.

The discounting has changed. Although the board believes that in general, the long-term expected rate of return continues to be an appropriate basis for the discount rate, there are limits on that. The notion of using the investment return as the discount rate is predicated on the idea that a substantial portion of the liability that a government faces for pensions is going to be satisfied by the earnings of the investments in the plan, the returns on the investments of those assets that have been put in the plan by the government, by the employees, and by other entities. And so, as long as that is true, that the benefits in any year are going to be sizably financed by resources that are generated by the plan itself, it makes the liability different. It is not the same as outstanding debt, because outstanding debt does not have, for the most part, a big pile of assets on the side that is helping to defray the cost of repaying the debt. But pensions do. That is why the board continues to believe that when you are trying to come up with an accounting measure that communicates how much that government is going to have to sacrifice going forward in terms of resources in order to make good on its pension benefit promise, discounting using the long-term rate of return makes sense.

What the new standards say, however, is that discounting using a long-term rate is reasonable only as long as there are, in fact, assets being invested long term in the plan. Governments will be expected to project out not just what their benefit payments are going to be but what is actually going to be in the plan to make those benefit payments for the current employees. If they reach a point where what they project is available for paying benefits is no longer sufficient to make those benefit payments, then it is no longer appropriate to use the long-term expected rate of return. At that point, it is just like any other obligation. It is just like debt because it is going to be paid entirely out of the general resources of the government, and for that reason, Statement 68 requires that discounting from that point forward must be based upon a municipal bond rate, specifically a 20-year tax-exempt AA-rated or higher or equivalent bond index or bond rate. So we are capturing, I think, some of what Don and Marcia were discussing, probably not enough to satisfy either one of them, but that is okay. The aims here are somewhat different than what they are trying to do.

In terms of other significant changes and how the liability is measured is the allocation that takes place after you have discounted to present value, where you are taking that present value and determining what part of it has already been earned, what is going to be called the “total pension liability” and used to be called the “actuarial accrued liability.” Whereas there are 12 options now, there will be no options going forward. Everybody will use entry age; they will apply it as a level percentage of payroll. To the extent that any comparability has been lost up to this point, and that seems to be what many people tell us, all that will disappear. There will no longer be

any loss of comparability because of the allocation methods that governments use.

Instead of the AAL, we have the total pension liability. Rather than the actuarial value of assets, that smoothed value, the liability will be measured using the market value of the plan's assets as of the date that you are measuring the total pension liability. So there will no longer be that lag that resulted in some plans' funding ratios improving in the year after 2008 because they were still smoothing in increases in asset value from prior years that more than offset the portion of the loss in 2008 that was smoothed into the value. The difference between those two is the net pension liability, and that is the amount that governments are going to book, that is what they are going to put on the face of the financial statements. Whereas they used to disclose only the unfunded liability, now this net pension liability will be on the face of the financial statements, right next to outstanding debt and compensated absences and claims and judgments and other long-term obligations of the government.

It is also worth pointing out, for governments that are in cost-sharing plans, that under the existing accounting standards, there is a big falloff in the amount of information you get. And that is unfortunate, because the majority of state and local governments in the United States participate in cost-sharing plans. The new pension standards do not give governments in a cost-sharing plan an out anymore. They are required to book a liability as well, a net pension liability that is their proportionate share of the net pension liability of the entire plan in which they participate. That will generally be based on their contribution effort relative to the contributions of all of the participants in the plan.

So each government, regardless of the type of plan it is in, will be booking a liability that represents the difference between what is available to pay benefits in the plan and what the total obligation is. So even for governments in cost-sharing plans, you will get a sense of what they are going to be expected to sacrifice going forward in order to make good on their pension promise. You will also see that pension expense will be significantly higher because it will much more closely track changes in the net pension liability. In the past, when items were introduced into pension expense over a 30-year period, such as changes in benefit terms if a big sweetener was given, you did not see the impact right away in their liability or in their pension expense; it got amortized and brought in through the ARC over a 30-year period. That is over. The new standards will mean that the effect of those changes in benefit terms on the net pension liability will be reported as pension expense immediately in the year that they happen.

Other things that affect the change in the pension liability, such as experienced gains and losses and changes in assumptions that are used to measure the liability, will be reported initially as a deferred inflow or deferred



outflow of resources and then introduced into pension expense systematically over a period equal to the average remaining service life of all members of the plan, both inactive and active. I cannot tell you how much that is going to be, it is going to vary from government to government, but I guarantee you it is not going to be 30 years. And if it were less than 10, it would not surprise me.

The reason the entire change in the pension liability is not expensed every year the way that the FASB does it is because the FASB's conceptual approach is to look at this transaction as a year-to-year transaction, that each year the employer and the employee have a new transaction, a part of which results in pension benefits. But the GASB's approach is to look at this as a career-long transaction between the employee and the government, and therefore certain things like this do not need to be introduced into pension expense immediately, they can be introduced over a longer period of time.

The same goes for the impact of differences between projected and actual earnings, but the bottom line here is that the cost of pensions is going to be recognized much faster than it is right now, and it is likely to be a much greater number than governments are reporting under the existing standards.

So what is the value of these changes? It should be a much more accurate depiction of the degree to which governments are going to have to come up with resources in order to satisfy this obligation. You will see a ratio of the total pension liability to fund net position, which is analogous to the AAL divided by the actuarial value of assets, which is the funding ratio. This will be an analogous number, but it will not be subject to the approach to funding, and it will not be subject to the smoothing of values. It will be a much fresher and much more up-to-date indication of the sufficiency of assets to cover the obligation.

The disclosures may not do everything that Don wants them to do, but they are going to be in some ways extraordinarily improved over what governments report right now, if for no other reason than the big disparity between what governments in cost-sharing plans disclose versus other governments will largely be eliminated. Most governments will report essentially the same exact information and present required supplementary information (RSI) schedules that cover the last 10 years that will give you a really nice historical sense of why the pension liability has changed over time and provide you with a lot more information that you can use for comparison purposes to see if a pension is keeping pace with the liability, instead of just looking at the ARC. You can look at service cost, at interest on the liability, on all the components that ultimately cause the liability to grow over time, and you can identify the items that you want to see, to compare with what contributions are to satisfy your feeling that the

government is keeping pace or making progress on meeting that obligation in the long run.

## QUESTIONS AND ANSWERS

### **Question: Under the New GASB Standards, Will the Net Pension Liability Be Required to Be Actuarially Based, or Can Issuers Migrate Away from That?**

**Dean Michael Mead:** You cannot come up with a net pension liability without having an actuarial valuation done. The foundation of the measurement of the liability is an actuarial valuation. It will be one that will be fresher, that will be much closer to the date of the financial statements, and so it will be a much more up-to-date number, but the government still has to engage an actuary in order to make that measurement.

### **Question: For the Analyst Who Wants to Continue to Be Able to Calculate an ARC under the New Standards and See How the Funded Ratio Compares to Previous Years, Is There a Back-of-the-Envelope Approach That Can Be Used from the Numbers That Will Be Provided, So We Can Have That Continuity?**

**Dean Michael Mead:** If a government bases its contributions on an actuarially determined amount, which most governments do now—and it is the ARC—the new standards will require them to present a 10-year schedule in the RSI that will show what that actuarially determined contribution amount was, how much they actually contributed, and then compare that actuarially determined contribution with their covered payroll. It is a very similar schedule to the employer contribution schedule in RSI that some governments present now. I don't have any reason to believe that governments that are using the ARC as the basis for their contributions will stop doing that. So that will be combined with disclosures about what their funding policy is, which they still will have to make.

If the ARC is important to you, you will still get the ARC, but you will not get it for governments that do not base their contributions on that. If a government makes its contributions based upon a statutorily required amount—that is, the state legislature says every year that this is how much members of the cost-sharing plan have to pay—then what you will get is a comparison of their statutorily or contractually required contribution with what they actually make; there is no rationale for comparing them to the ARC because it has nothing to do with their approach to making contributions.

**Question: Do You Expect the Changes to Affect Government Funding Practices?**

**Dean Michael Mead:** I don't have any reason to believe that this is going to have any impact on funding at all, and we have been as clear as possible to say that we have divorced the two, and that what we are doing in these new standards is solely an accounting measurement and that how governments fund is their business and not ours. But the industry, such as the GFOA and other organizations that have gotten together to establish some best practices for funding going forward, are more or less advocating a continuation of the approach that governments take now, which is to have an actuarially determined contribution, and that is likely to continue to be the ARC.

**Question: Regarding Going from Having to Use the Municipal Bond Rate Versus the Expected Rate of Return, Isn't There an Accounting Arbitrage Opportunity to Issue Pension Obligation Bonds at a Taxable Bond Rate in Order to Go from, Say, a 4% Municipal Rate to a 7.5% Expected Rate of Return? If You Start to See Trends Where People Are Issuing More Pension Obligation Bonds to Take Advantage of Being Able to Switch to That Higher Discount Rate, What Might That Do to How Moody's Evaluates Both Debt and Pension Liabilities?**

**Marcia Van Wagner:** I am not sure that the discount rate that we are using will affect a government's decision to issue pension obligation bonds. We do think that there is some arbitrage that goes on with pension obligation bonds, where they think they can get a higher rate on the proceeds of the bonds than what they have to pay for them, which is, as we pointed out, a risky assumption. But I am not sure that what we do has any impact on pension obligation bond issuance. Our view of pension obligation bonds is that they do introduce some risk, because of the fact, first, that they are sometimes issued with arbitrage in mind, and second, that they convert a liability that is maybe more variable into one that is a hard liability that is subject to default, and that is, I think, a risky proposition for governments to undertake.





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