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THE ARC AND THE COVENANTS

ASSESSING THE ABILITY OF STATES TO SERVICE DEBT,  
PENSION AND RETIREE HEALTH CARE COSTS  
IN A WORLD OF FINITE RESOURCES

J.P.Morgan

## The ARC and the Covenants: assessing the ability of US states to service debt, pension and retiree health care costs in a world of finite resources

This year is shaping up along the lines of what we outlined in the 2014 Outlook. While economic growth is now getting better and corporate profits are rising (US, Europe), much of this was already priced into equity and credit markets. Our forecast was for a year of single digit returns on developed and emerging market equities, credit and real estate, with equities driven by earnings growth rather than P/E multiple expansion. The contours of this outcome are becoming clearer as we approach mid-year. With US GDP growth set to improve in Q2 and Q3, our forecast for 8%-10% S&P 500 earnings growth in 2014 is still within reach (Q1 S&P 500 earnings growth came in at ~6%).

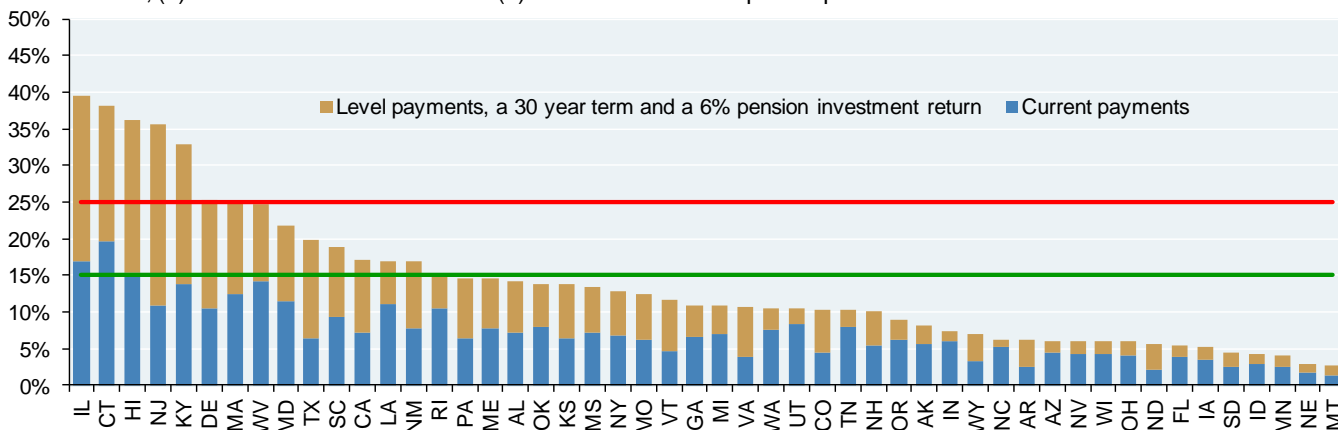
**The ARC and the Covenants.** In many meetings, I am asked about risks related to US states and cities. A recent piece from Bridgewater Associates stated that 85% of public pension plans may default over the next 30 years, assuming investment returns of 4%. There's less insight in this statement than you might think: basic math shows that a plan underfunded by 30% will find it hard to earn its way out at 4% returns, and to discuss the topic as they did without reviewing contributions and adjustments that many states are making neglects an important part of the picture.

I have spent the last few weeks sequestered on this project, whose goal is an **assessment of each state as it allocates finite resources to bondholders, pensioners and other stakeholders**. In some states, the share of tax collections used to pay debt and retirement expense is rising, requiring states to raise taxes, reduce non-pension spending, increase worker contributions to pensions, and/or reduce pension expenses. When the choices become more difficult, the risks to bondholders rise; we have seen this play out in a few cases at the city level. As managers of \$33 billion of municipal bond assets that often represent a client's "safe harbor" portfolio, this kind of analysis is an important part of our investment process. We thought that a deep dive on the subject would be of interest to many of you. This note is longer than usual, but it's mostly charts which I think tell the story on their own.

As a summary of our findings, the chart below looks at each state's debt and retirement costs relative to its revenues. We show what states currently pay, and for purposes of comparison, the higher amounts states would need to pay assuming both a fuller accrual of future costs and a 6% investment return in the pension plan. While these are qualitative judgments, a ratio of 15% or less using the latter set of assumptions indicates to me a state that's in good shape, while 25% indicates a state facing very difficult choices. We explain how this all works in more detail in the pages ahead; these are just two scenarios of many, and there are a lot of assumptions involved.

### What states are currently spending, and what they would have to pay assuming a lower pension investment return and fuller accrual of pension and retiree healthcare costs

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

Even under the more adverse set of assumptions, most states still have debt service ratios of 15% or less. A handful of states, however, have much higher ratios. Most of this latter group already faces difficult choices and will likely be in the headlines as their legislatures deal with the issue, and as new Governmental Accounting Standards Board guidelines cast a brighter spotlight on it. All things considered, while problems are considerable in a few states, to call this a national crisis at the state level may be an overstatement given the prior chart. **Our conclusions argue for diversification in municipal investments, and substantial due diligence when selecting securities.**

Of the analyses I have worked on over the last three decades, this might be the most complicated of all: the numbers are large (see table below), the political issues are complex, state disclosures of retirement costs are non-standardized and unclear in quite a few cases (see important disclosures in Appendix A), and the math involves annuity formulas in which small changes can make a huge difference. We drew on a variety of resources to complete it<sup>1</sup>. One issue that emerges from this analysis and which deserves separate treatment: even when a state's credit fundamentals are strong, there may be questions about the finances of its cities which share the cost of unfunded pension and retiree health care liabilities, and which could reverberate back to the state.

**"The ARC and the Covenants"** refers to commitments that states have made to public employees, and the means by which most states honor them (through "Annual Required Contributions"). Before delving into this, I want to be clear about something. Public sector workers form a critical part of American civil society. They are the people who rescue us when we are in danger; the people who make our lives safer, cleaner and more efficient; the people to whom we entrust the education of our children; the people who enforce the rule of law and provide remedies when those laws are broken; and the people we rely on to heal us when we are sick. A look at the legal, medical, environmental and educational challenges that other countries face is one way of imagining what life would be like without them. **These individuals earned the benefits they have accrued and which were granted by state legislatures, and have every right to expect them to be paid.**

Michael Cembalest  
J.P. Morgan Asset Management

### Some data points

State debt supported by state tax collections and general revenues, 2012	\$516 billion
State share of unfunded state pension liabilities using state assumptions on future investment returns, which generally range from 7%-8%; year-end 2012	\$484 billion
State share of unfunded retiree health care obligations; year-end 2012	\$444 billion

Sources: Moody's, Pew Research, State Comprehensive Annual Financial Reports, JPMAM calculations.

<sup>1</sup> We appreciate the input and insights from the following individuals and organizations: Pew Research, the Governmental Standards Accounting Board, the National Association of State Retirement Administrators (NASRA), the Society of Actuaries, Moody's, Standard & Poor's, select auditors and actuaries from specific states, state-specific independent research think tanks, the Center for Retirement Research at Boston College, Malcolm Hamilton (Mercer, 1979-2012), and Professor Joshua Rauh of Stanford.

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### I. What states are currently spending on debt and retirement expense

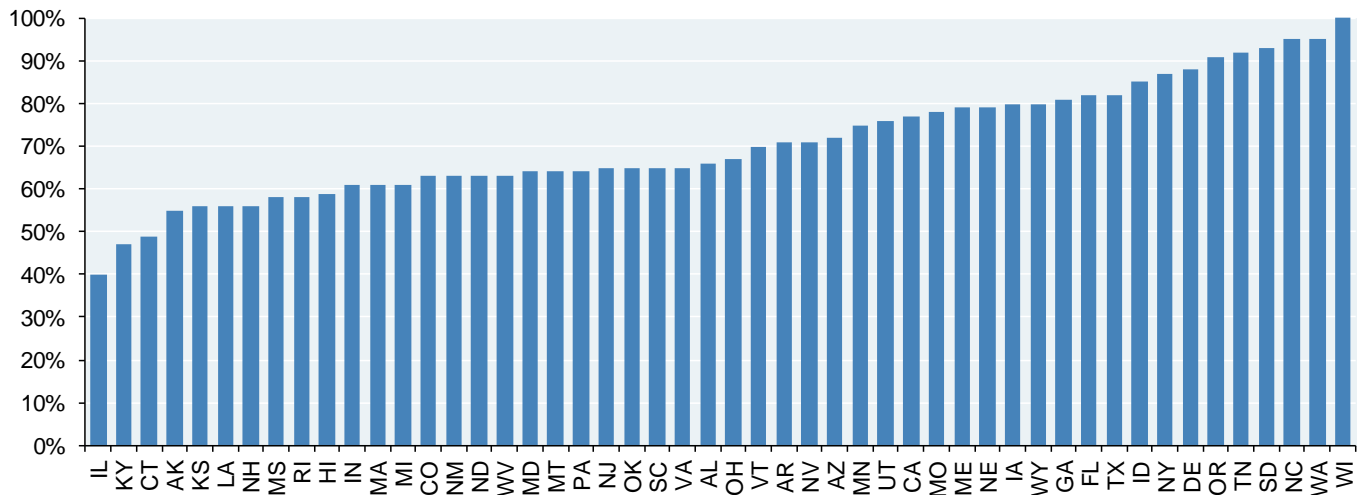
If you made it this far, you are presumably interested in understanding how this all works. The approach that makes the most sense to me is to look at the cost of servicing debt relative to the cash flows that states collect. I am less interested in “debt per capita” and “debt per unit of GDP”, since these are more abstract. While the latter two measures can be used to compare states, they do not help us understand when a state, looked at on its own, faces a problem.

Our debt service ratio is based on the amount each state spends on debt and retirement expense relative to revenue collections. To determine this ratio, we add four annual costs together:

**Debt Service Ratio, DSR**  
 $DSR = [I + P + O + D] / R$

- *I, interest on state bonds<sup>2</sup>.* We assume an interest rate of 5%, and include bonds supported by state tax and other general revenue collections. We exclude “revenue bonds” (e.g., toll roads), special assessment bonds and other securities whose primary source of repayment is not revenues in the General Fund and other operating funds. See Appendix B for more details.
- *P, monies spent by each state on its pension plan.* These payments include an amount based on costs accrued in that year, and also usually include an amount designed to partially pay down unfunded liabilities. The chart below shows the funding ratio for each state’s pension system (in effect, the weighted average funding ratio of its various single employer and multi-employer plans). In general, the lower the funding ratio, the more a state would need to pay into the plan to resolve it. As a point of comparison, the average funding ratio of defined benefit plans in the S&P 1500 was 95% at year-end 2013. Note that corporate funding ratios are computed using lower discount rates to value liabilities than public plans use (see chart on page 11).

Aggregate funding ratio of each state's single employer and multi-employer defined benefit pension plans



Sources: Pew Research; 2012. Computed at the plan level.

- *O, monies spent by the state on OPEB (retiree health care).* Most states offer retiree health care coverage, which is referred to as OPEB (Other Post-Employment Benefits). Some states operate on a pay-as-you go basis; others fund future obligations accrued each year; and others pay amounts into a trust to partially pay down unfunded liabilities that already exist. States are heterogeneous in terms of what they offer (i.e., the degree to which they cover pre-Medicare costs, and for older retirees, expenses not covered by Medicare). See Appendix C for more details on how OPEB works, how states differ and recent trends regarding OPEB adjustments.

<sup>2</sup> While municipal bonds amortize, we assume that states refinance their maturing principal in the bond markets. Instead, if we were to include the cost of amortization, the debt ratios shown on page 5 would increase by 0.5% to 2.0% for most states, and by 3.0% for the most highly indebted states.

- *D, payments into defined contribution plans.* Around 30 states have introduced defined contribution plans into their pension systems (most offer them as part of state university retiree plans). The dollar amounts are small, since defined benefit plans are still the overwhelming preference of states. As a reference point, US corporate pension plans are split 30 / 70 between defined benefit and defined contribution when measured by number of employees.

**Regarding “P” and “O”, we only include pension and OPEB payments that states make with respect to their obligations to state-run plans.** What does this distinction mean? Some state-run plans are multi-employer plans in which state, county and city workers participate. As a result, many states have *partial* responsibility for certain plans, with cities and counties responsible for the remainder. In other cases, states have substantial or entire responsibility for certain plans despite the presence of local workers in them. The bottom line: since we analyze obligations relative to a state’s revenue collections (and without the benefit of local revenue collections), we only include the **state’s share** of pension and OPEB expense. State share information is non-standardized, at times unclear and sometimes not reported at all; see Appendix A for important disclosures and assumptions.

**After adding the four costs together, we divide them by “R”, annual revenue collections.**

Our denominator includes state tax collections (most of which are derived from income taxes and sales taxes), and select revenue items that make their way into the General Fund. Examples of the latter include interest earned on the General Fund, proceeds from government sponsored lotteries, and revenues/royalties associated with natural resource exploration. We also include net profits of state liquor monopolies (for some reason, this is a large contributor in Ohio). States where non-tax revenues contribute 25%+ of total revenue collections: Alaska, Delaware, Louisiana, New Hampshire, New Mexico, Rhode Island, South Dakota and Wyoming.

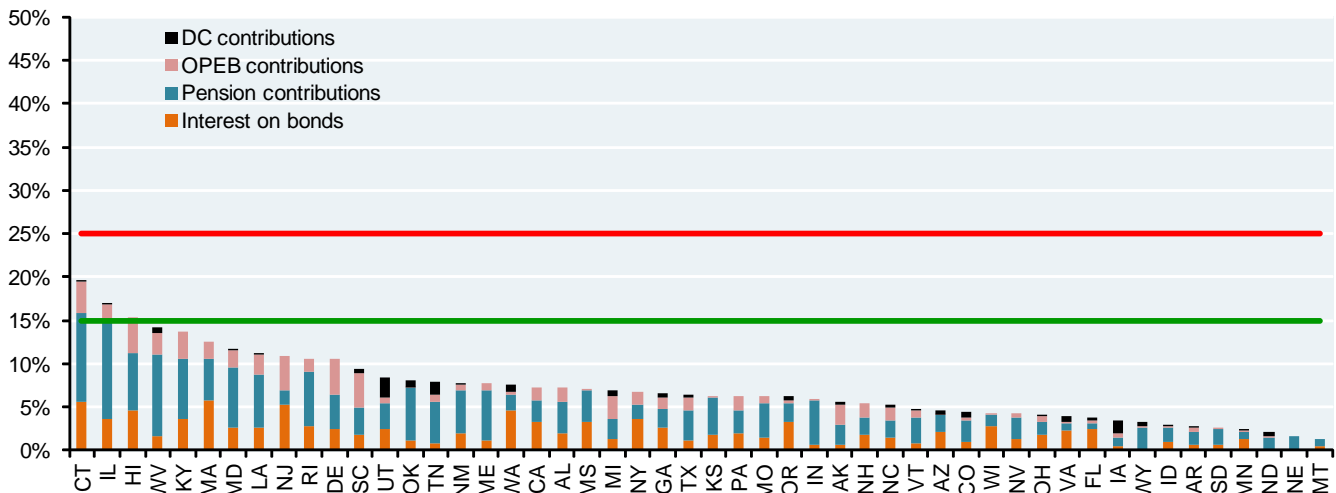
Debt Service Ratio, DSR

$$DSR = [I + P + O + D] / R$$

When measuring the debt service ratio based on what states are *currently* paying, most dedicate less than 15% of revenues to debt and retirement expense. The chart below breaks down the debt service ratio by cost component. Next, we look at some alternative scenarios.

The debt service ratio based on current payments

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses

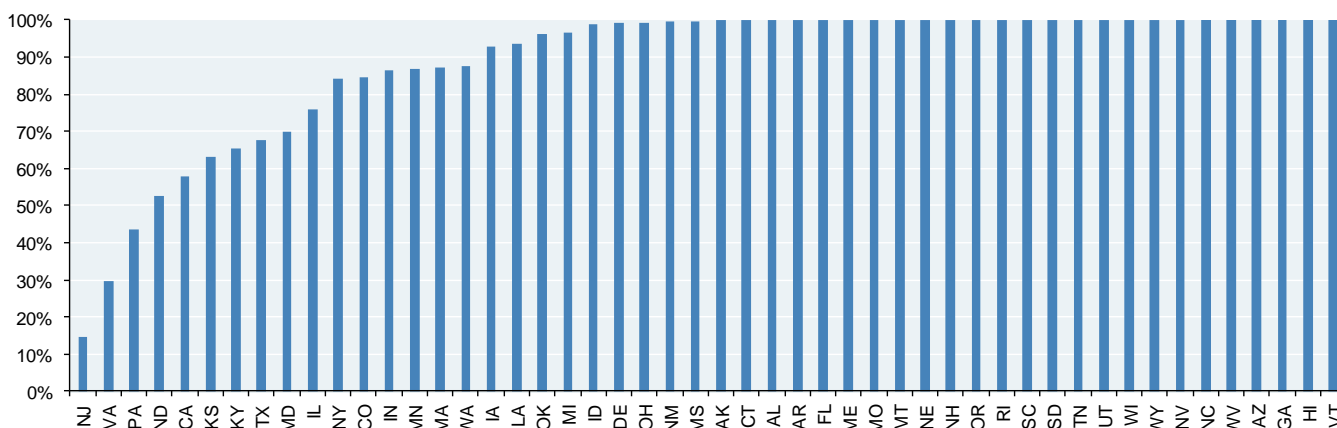


Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody’s; Census; Merritt; Loop Capital Markets. All data as of 2012.

## II. What states are required to pay, according to their published assumptions

In many states, contributions to pensions are based on what actuaries tell them is needed. An actuary bases this amount on two components: (a) “normal” costs, which account for benefits earned by employees in that year, and (b) payments to amortize any unfunded liability (over a given number of years and assuming an investment return on the plan’s assets). The total payment is referred to as an **ARC**, which stands for “**Annual Required Contribution**”. While the word “required” is part of the ARC acronym, it is not enforced by Federal or local regulations. The lack of enforcement notwithstanding, **in 2012, many state contributions to pensions were at or close to their ARC (next chart)**. The exceptions: Kansas, Kentucky, Texas and Maryland contributed 60%-70%; North Dakota and California contributed 50% - 60%; Pennsylvania contributed 40%; and New Jersey and Virginia contributed less than a third. As a reminder, the ratios below are for the state’s share; in states like Florida, Montana and Ohio, while the *state* contributed 100%, plan level contributions were less than 100%, implying that local entities did not make their full payments.

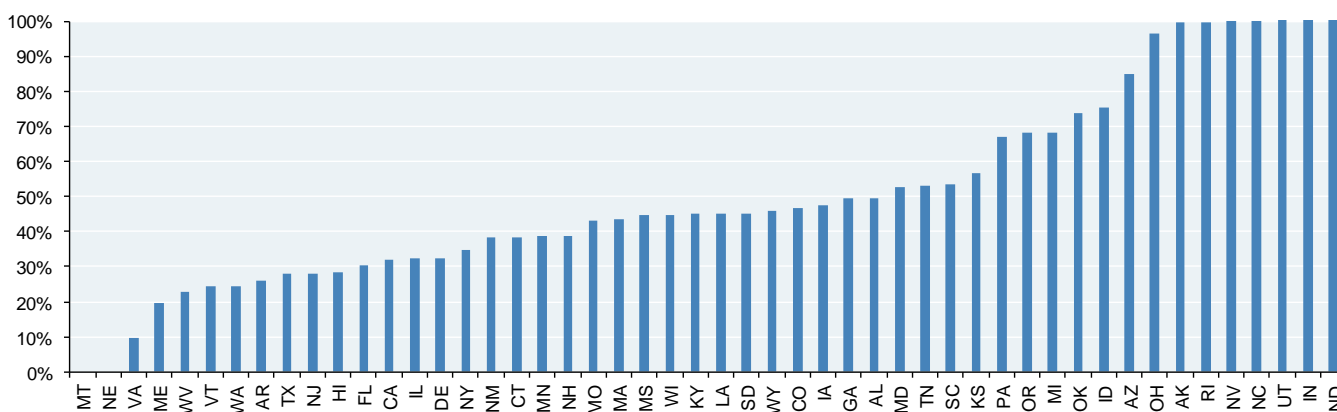
**Each state's actual pension contribution as a percentage of its Annual Required Contribution (ARC), 2012**



Sources: state/pension plan Comprehensive Annual Financial Reports. Note: these ratios are computed at the state level, not at the plan level.

States also report Annual Required Contributions (ARCs) for OPEB. In 2012, most state’s actual contributions to OPEB plans were below their OPEB ARC (next chart). Aside from the few states making full contributions, most states contributed 30%-60% of the OPEB ARC in 2012.

**Each state's actual OPEB contribution as a percentage of its Annual Required Contribution (ARC), 2012**

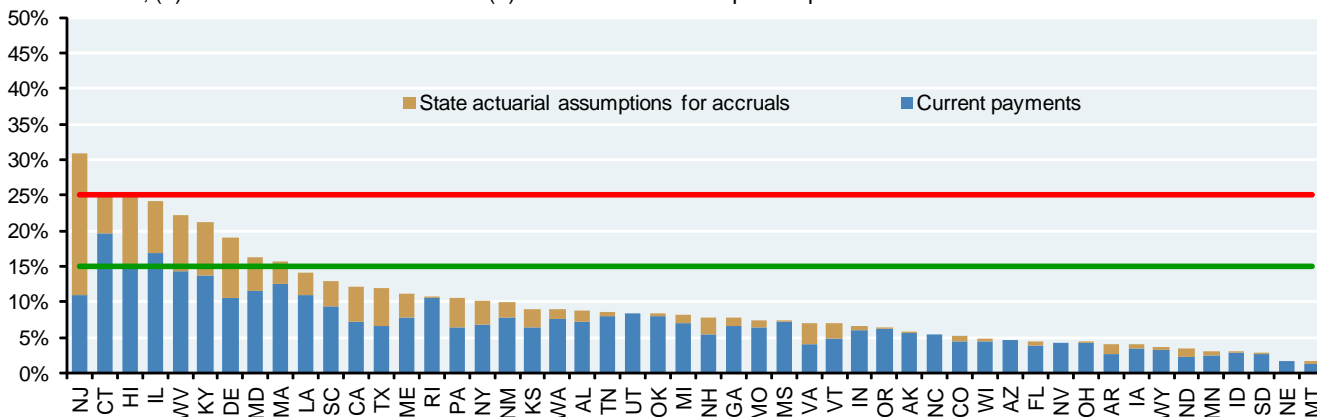


Sources: state/pension plan Comprehensive Annual Financial Reports. Note: these ratios are computed at the state level, not at the plan level. Nebraska does not offer OPEB to retirees. Montana makes annual contributions to self-insurance plans but does not report the state’s share as part of an OPEB obligation.

When we recompute debt service ratios based on Annual Required Contributions for pension and OPEB (next chart), the 5-7 states on the left experience large increases. New Jersey in particular has a large jump, a consequence of the state’s low actual contributions to pension and OPEB, and of its more conservative actuarial determination of the ARC (we will explain and adjust for this shortly). New Jersey has historically made significantly lower actual contributions than its ARC, with disagreement as to what led to the current state of affairs and what to do about it<sup>3</sup>.

Using the state's own assumptions for accruals

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses

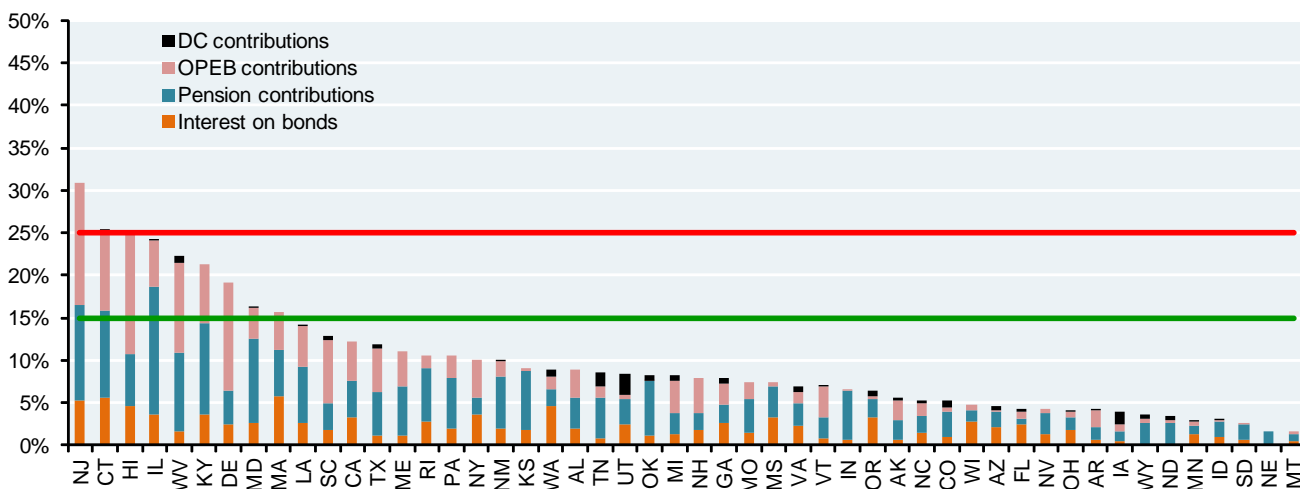


Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

The next chart breaks down ARC-based debt service ratios by cost component. In Hawaii and Delaware, OPEB has a bigger share of the state burden than pensions, while in Illinois, the reverse is true. **This has important implications when thinking about potential cost mitigation, since as we discuss later in this document, states have been more active in restructuring OPEB than pensions.** In Connecticut, New Jersey and West Virginia, the burden is split equally across pensions and OPEB.

Using the state's own assumptions for accruals

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

<sup>3</sup> "Blame Game on Pensions in New Jersey: Governors Disagree Over Reasons for State's Pension Troubles", Wall Street Journal, May 28, 2014



Before moving on, there's a common factor among states with the highest debt service ratios that is worth highlighting. On page 5, we describe how states often share responsibility for Annual Required Contributions with local entities, typically based on their respective share of workers. The table below shows the share of 2012 pension ARCs that belonged to the state; the remainder belonged to local entities. One reason for the dispersion: states vary in terms of the responsibility they assume for locally-employed teachers and other local employees. The states on the left rely more on local entities to be responsible for local obligations, and tend to have lower state debt ratios.

**Aggregate state share of state-run pension plan Annual Required Contributions, 2012**

0%-25%	25%-50%	50%-75%	75%-100%
AZ; AR; FL; ID; IA; MN; MT; NV; OH; OR;	AL; AK; CA; CO; GA; LA; MI; MS; MO; NE; NH; NY; NC; SC; SD; UT; VA; WA; WI; WY;	HI; IN; KS; NJ; NM; OK; PA; RI; TN;	CT; DE; IL; KY; ME; MD; MA; ND; TX; VT; WV;

These calculations are based on pension ARCs from 2012 State Comprehensive Financial Reports, divided by pension ARCs from PEW Research that were computed for 2012 at the overall plan level.

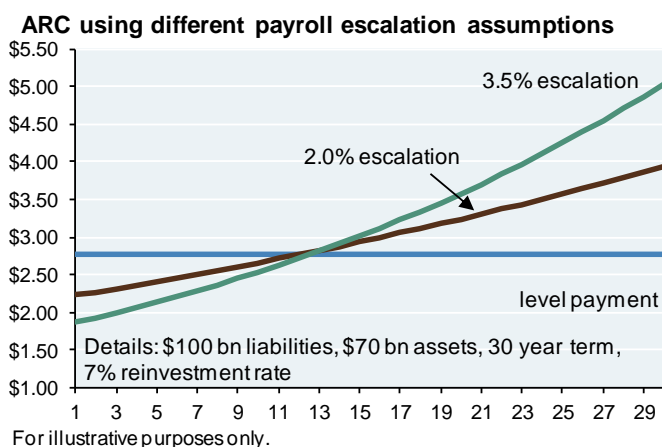
In contrast, states with the highest debt service ratios tend to have substantial responsibility for teacher plan employer contributions, rather than local entities being responsible for them. For the 10 states with the highest debt service ratios on page 7, the table below shows the % of the state's ARC in 2012 comprised of the teacher component; and the state's responsibility in 2012 for employer contributions into the teacher plan (vs local entities). In some cases, cities make offsetting payments to the state, but based on our conversations with Moody's, such payments do not substantially reduce the state's net obligation.

States with highest debt service ratios	% of state pension ARC devoted to state-run teacher plan, 2012	State responsibility for employer contributions into state-run teacher plan, 2012
New Jersey	60%	100%
Connecticut	45%	100%
Hawaii	NA*	NA*
Illinois	52%	100%
West Virginia	74%	100%
Kentucky	61%	100%
Delaware	NA*	NA*
Maryland	63%	100%
Massachusetts	60%	100%
Louisiana	6%	4%

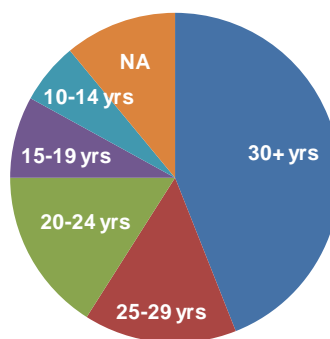
Source: State and Teacher plan Comprehensive Annual Financial Reports, 2012. \*Hawaii and Delaware do not have distinct pension plans for teachers.

### III. What states would be paying under an accrual-based, non-back-loaded approach

It might seem that if a state met its Annual Required Contribution each year, the associated unfunded liability would be extinguished as long as the projected investment return was realized over the assumed term. That’s true except for one caveat: many states use an actuarial approach that allows the amortization component of the ARC to rise over time, rather than requiring a fixed payment every year<sup>4</sup>. The rationale as I understand it is that since payrolls rise over time, the ARC should rise as well. Perhaps, but no matter what the logic, this approach results in back-loaded contributions. The line chart below shows the difference between a level-payment approach and one that allows the ARC to escalate at 2.0% or 3.5% per year. **The bottom line: assessing pension and OPEB costs based on the current year ARC published in Comprehensive Annual Financial Reports may underestimate long-run accrual-based costs<sup>5</sup>; and since states use different approaches, it makes sense to standardize them.**



Public pension plan amortization periods



Source: Boston College - Public Plan Database.

In the next stage of the analysis, we amortize all unfunded pension and OPEB liabilities using a level payment approach (e.g., no back-loading of ARCs). We also use a consistent 30-year term in re-computing the ARCs, rather than using the various terms assumed by states. This helps normalize the analysis, and avoids penalizing states that use shorter amortization than others. The pie chart shows the breakdown of amortization terms currently used by the 126 plans in the Boston College Public Plan Database for fiscal years 2011/2012.

Before we review the results of this approach, there’s one more adjustment we made. Our asset, liability and ARC data by state are for fiscal year 2012. However, fiscal year 2013 was a good year for public pension plan returns. As a result, we grossed up 2012 pension plan assets by an average return of 13.5% (based on typical public pension plan asset allocations and index returns for 2013), and grossed up 2012 liabilities by a national average rate from Milliman Research (around 4.75%).

<sup>4</sup> Most states only report the ARC from the current fiscal year in their state financials, and do not explicitly report the trajectory of future Annual Required Contributions. There is a paper cited in the sources from Gabriel Roeder Smith & Company (GRS), which goes into detail on how this all works.

<sup>5</sup> ARCs may also include smoothing assumptions which gradually phase in over time to soften its impact. In our level payment approach, we do not smooth the ARCs since we are trying to gain a better sense of the fully loaded current cost of unfunded liabilities.

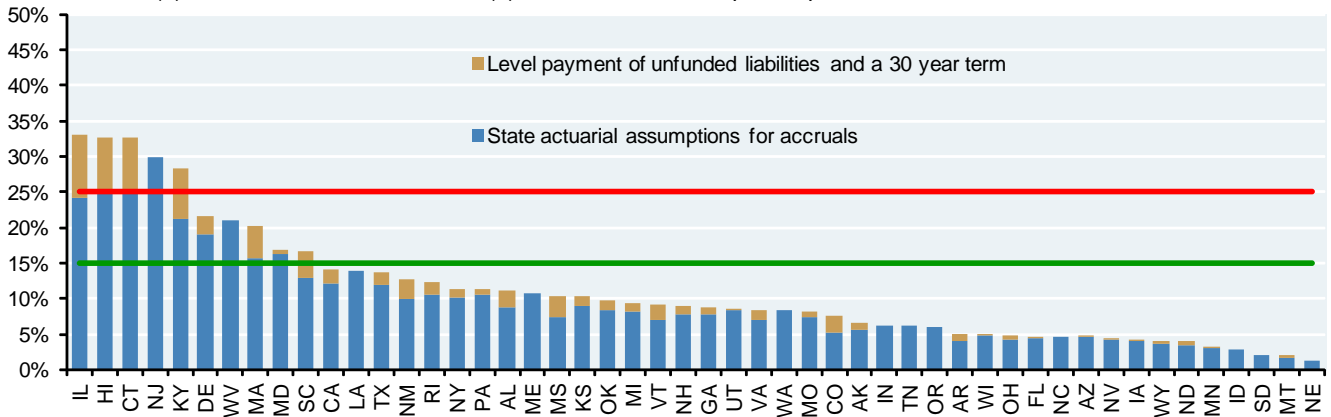
**After factoring in a level payment approach, debt service ratios rise notably for a few states, but for most of them, ratios remain at or below 15%:**

- For states whose pension plans are fully funded or close to it, the amortization of unfunded liabilities is small enough such that switching to a level payment approach does not materially affect the results; and if their OPEB liabilities are small, level payment does not make a large impact on that component either
- Some states are negatively impacted by switching to level payment, but the impact is offset since our 30-year normalized term is longer than their shorter ones
- Some states are not impacted since they use level payment to begin with (e.g., New Jersey, West Virginia and Louisiana)

The incremental stacked bars below show the impact from switching to a standardized level payment approach. The states most impacted from the switch to level payment: Illinois, Hawaii, Connecticut and Kentucky.

Using level payment for accruals and a consistent 30 year term

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses

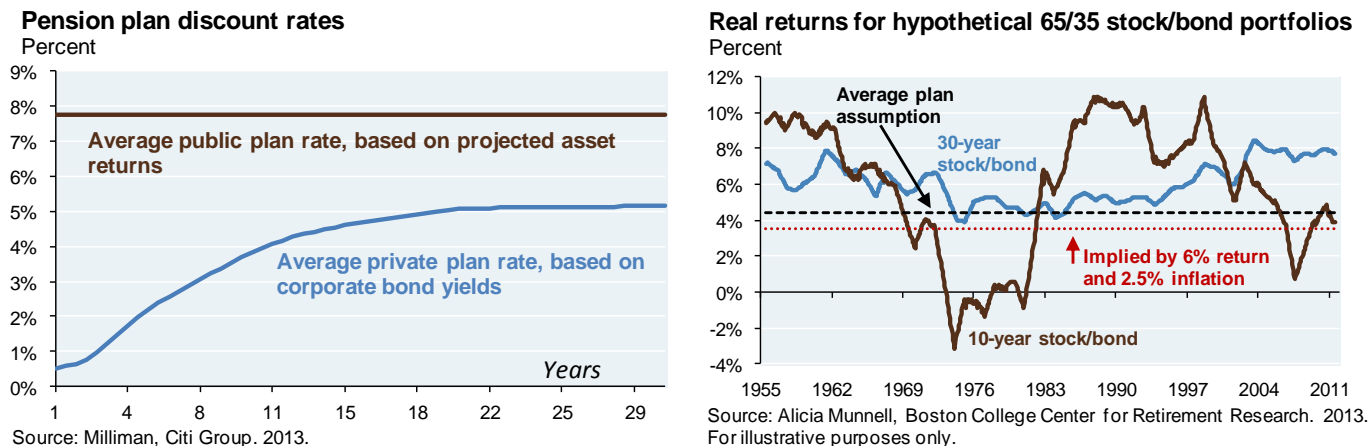


Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

To many analysts, 30 years is a long time over which to address unfunded liabilities, at least when compared to corporate plans. According to the Pension Protection Act of 2006, companies covered by the auspices of the Pension Benefit Guarantee Corporation must contribute funds to eliminate unfunded pension liabilities over a 7-year period. A 2014 report commissioned by the Society of Actuaries recommends a period of 15-20 years for public plans, rather than 30. Appendix D shows the difference between 30- and 15-year amortization periods on debt service ratios.

#### IV. What states would have to pay if they used different pension investment returns

One of the most heavily discussed topics in pension finance relates to assumed investment returns. These returns are used by actuaries as discount rates when valuing future liabilities. As shown below in a chart from a January 2014 *Eye on the Market*, there's a fundamental difference between public and private pension approaches. Public plans base discount rates on assumed future investment returns on their assets, while corporate plans base discount rates on high grade bond yields.



A lot has been written about return assumptions used to discount pension liabilities. We are not going to try and settle the debate here. Instead, here's a summary of some recommendations from an independent Blue Ribbon panel commissioned by the US Society of Actuaries, published in February 2014:

- While trailing 10-year real returns on a 65/35 stock/bond portfolio have been *below* most plans' average assumed real rate of return, the 30-year stock/bond real return has been *higher*, and consistently so since 1955. This is shown in the chart (right) in which the blue line is consistently higher than the black dotted one. Hence the panel's view, "return experience does not readily suggest that return assumptions currently in use have been inconsistent with prior experience".
- However, while historical returns can be a useful reference point, return assumptions should be based on a risk-free rate plus explicit forward-looking risk premia
- As a separate risk measure, the panel recommends disclosure of plan liabilities and normal costs using the risk-free rate

Currently, most states assume pension investment returns of 7.5%-8.0%. In the next step of the analysis, we examine what would happen if pension ARCs were recomputed assuming 6% investment returns. **The 6% is not a recommendation, nor is it a forecast of ours**<sup>6</sup>. It is a more conservative assumption designed to evaluate the sensitivity of Annual Required Contributions and the debt service ratio to changing investment returns<sup>7</sup>.

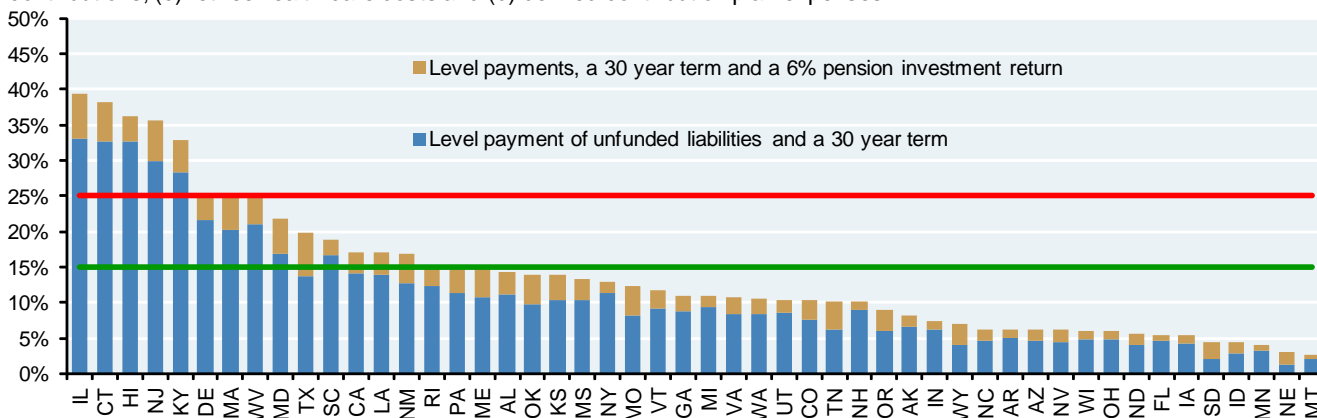
<sup>6</sup> We chose 6% to be conservative. While the conservativeness of a 6% portfolio return assumption can be debated, as shown by the red dotted line in the chart, **6% implies a real return of 3.5% (assuming 2.5% inflation), which is below realized historical 30-year real returns on a 65/35 stock-bond portfolio since 1955**. Separately, 6% appeared in a case study presented by pension actuaries Gabriel Roeder & Smith Company to the Florida Government Finance Officers Association conference in June 2012 as an example of using forward-looking risk premia.

<sup>7</sup> **This exercise is unrelated to new GASB proposals on reporting of unfunded liabilities.** A new GASB approach effective in 2015 uses a blend of each plan's existing investment return assumption and lower prevailing municipal financing rates. This approach appears to be a compromise between states and GASB. I am more interested in the economics than the accounting, which is why in the chart above, we stick to the concept of a single investment return assumption for the future and do not model the GASB approach.

While the *incremental* impact of a 6% return assumption is modest compared to the prior case...

Using level payments for accruals and a revised pension investment return

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses

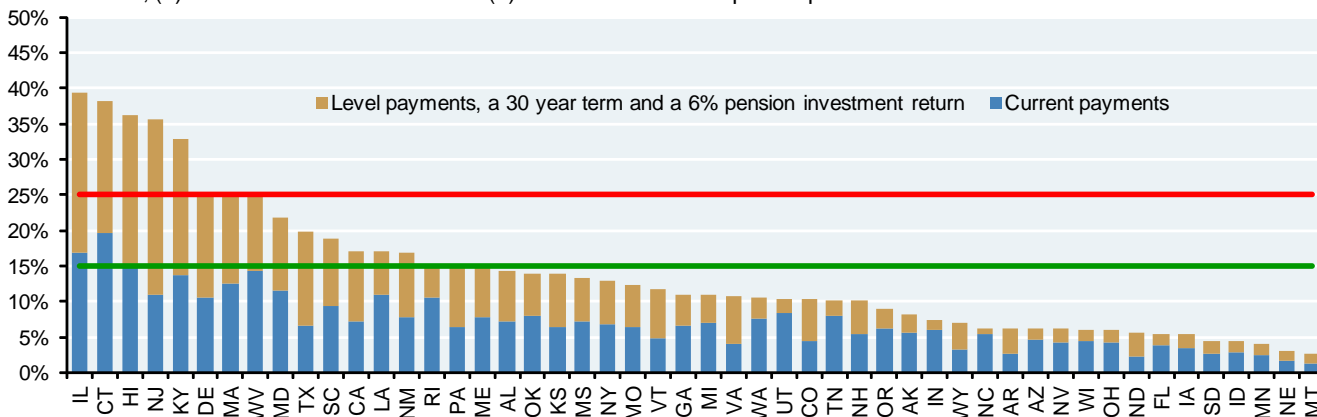


Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

...the cumulative impact of using level payments and a 6% investment return is large compared to what many states are currently paying. For the five states on the left side of the chart, the draw on state revenues from retirement costs would be felt acutely if they had to be currently funded.

Using level payments for accruals and a revised pension investment return

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

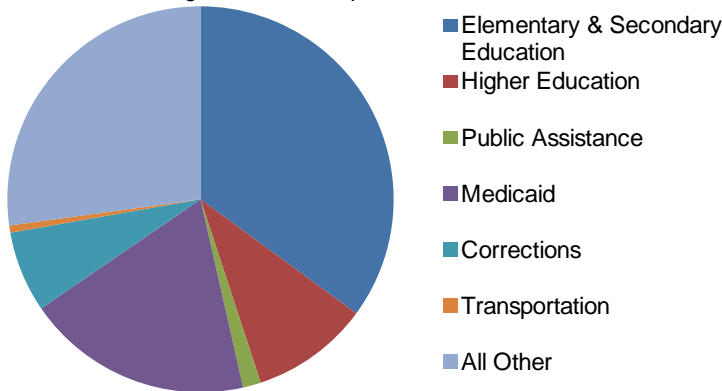
**Note that we do not revise discount rate assumptions for OPEB, since they are much lower than pension discount rates.** The rationale for using investment returns to discount pension liabilities is based on the existence of assets to invest in the first place. Since most states have not substantially prefunded OPEB liabilities (see p.20), they generally use lower discount rates to value them (**only five states use OPEB discount rates over 6%, and the median is 4.5%**). As a result, we do not revalue OPEB liabilities or recompute OPEB ARC payments in the charts above.

**V. A brief detour: what else do states spend money on?**

Before looking at ways of either reducing retirement expenses or raising additional revenues, what kind of spending might be curtailed if states, cities and counties had to make larger accrual-based pension/OPEB contributions at the expense of other things? As shown in the pie chart below, at the state level, spending on elementary, secondary and higher education is by far the largest component; other large categories include Medicaid and Corrections. The “All Other” category includes public health, environmental programs, parks and recreation, public housing and retirement expenses analyzed in this document.

**State general fund expenditures, 2013**

Percent of state general fund expenditures

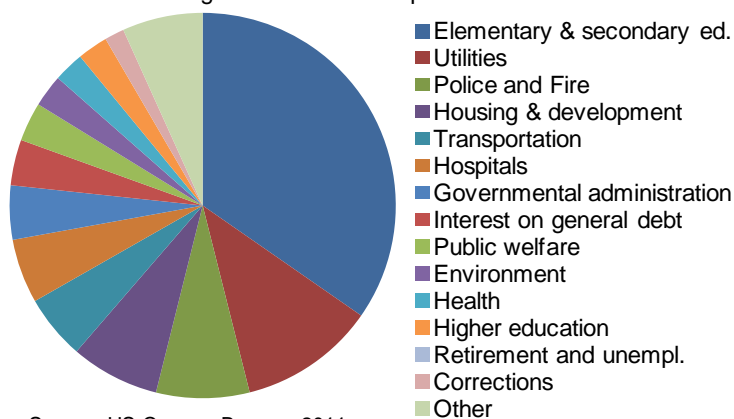


Source: National Association of State Budget Officers. 2013.

At the local level, education is also the largest component, followed by basic utilities and related infrastructure, transportation, police and fire, housing and hospitals. The Census computes local spending by category with a lag; 2011 is the latest year that is available. As an example of the dynamics in play in some places, Steven Malanga (Senior Editor at the urban policy magazine *City Journal*) notes that between 2010 and 2012, US school systems cut spending on salaries by \$7 billion and increased outlays on benefits by \$6 billion, largely driven by pensions.

**Local government expenditures, 2011**

Percent of local government total expenditures



Source: US Census Bureau, 2011.

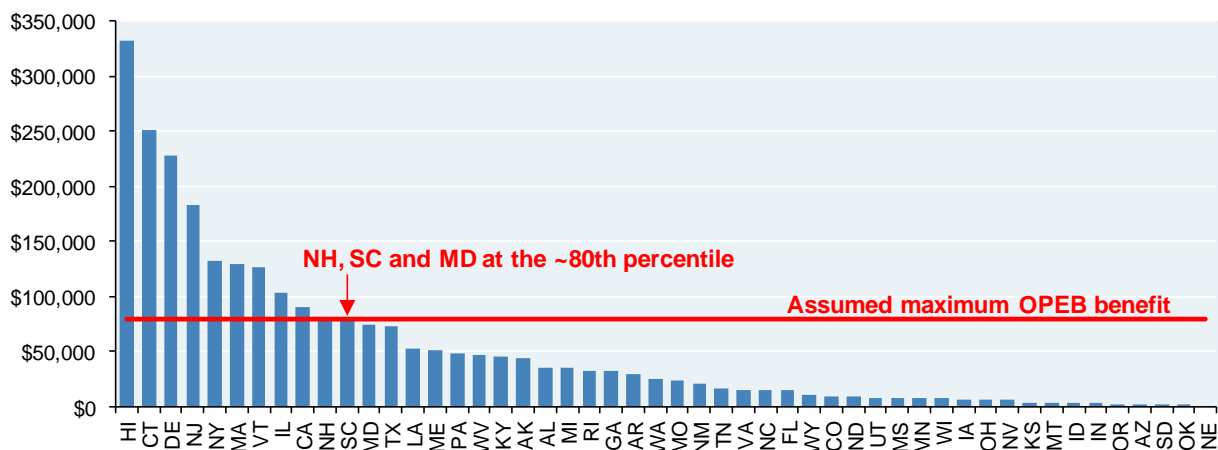
## VI. What states have done to reduce retirement costs

### There aren't a lot of options to reduce pension liabilities that have already been accrued.

Adding defined contribution plans could reduce the growth of *future* liabilities (~30 states already have some kind of DC plan as per their financials), but this would not impact unfunded liabilities already in place. Academics have looked at pension variables under a state's control and their impact on pension liabilities. The most common approach analyzed (and used in practice by several states<sup>8</sup>) is to reduce cost of living adjustment formulas applied to pensions (COLAs)<sup>9</sup>. According to our findings, 30 states have legislated COLAs (excluding "ad-hoc" versions). As a result, assumed COLA changes in the next step of the analysis only impact these 30 states.

**What about options to mitigate OPEB expenses?** States may have more flexibility to enact changes to OPEB than to pensions; this has certainly been the case in recent years, as many states have made changes to OPEB that affect both current workers and retirees (see Appendix C). We did not find studies which provide the sensitivity of OPEB liabilities to changes in specific plan attributes. Instead, we based potential OPEB adjustments on the fact that some states provide much larger benefits than others (this dispersion, shown in the chart below, is the most widely cited issue in published literature on OPEB; the Hawaii number is so large that we double-checked it with its State Accounting Office). Note that New Hampshire, South Carolina and Maryland are in the 80<sup>th</sup> percentile of OPEB liability per plan beneficiary. In our model, we assume that any state with OPEB liabilities per beneficiary above this level could reduce OPEB costs to the 80<sup>th</sup> percentile, effectively bringing them in line with these three states. In the future, ACA might play a role here<sup>10</sup>.

### Unfunded OPEB liability per beneficiary



Source: 2012 state Comprehensive Annual Financial Reports, 2012 Census data on pension plan retiree beneficiaries.

<sup>8</sup> **COLA changes.** The Center for Retirement Research at Boston College notes that of the 17 states that changed COLAs between 2010 and 2013, 12 were challenged in court. The courts ruled in 9 cases, and in 8 of them the courts allowed the adjustments under the notion that the COLA portion of the pension is not a contractual right.

<sup>9</sup> **Pension liability sensitivity to COLA.** The coefficients we used to estimate changes in pension liabilities from COLA reductions were taken from Rauh's 2011 paper (see sources). Rauh estimates liability reductions of 8.7% for a 1% COLA reduction. We found very similar COLA coefficients in a 2014 paper from the Center for Retirement Research at Boston College. Rauh also published pension liability coefficients related to retirement changes (retirement year extensions and changes to early retirement incentives), but we do not model them here. Such changes are typically applied to new hires and not retroactively to existing employees. Ohio and Illinois are exceptions, having extended retirement ages for current workers.

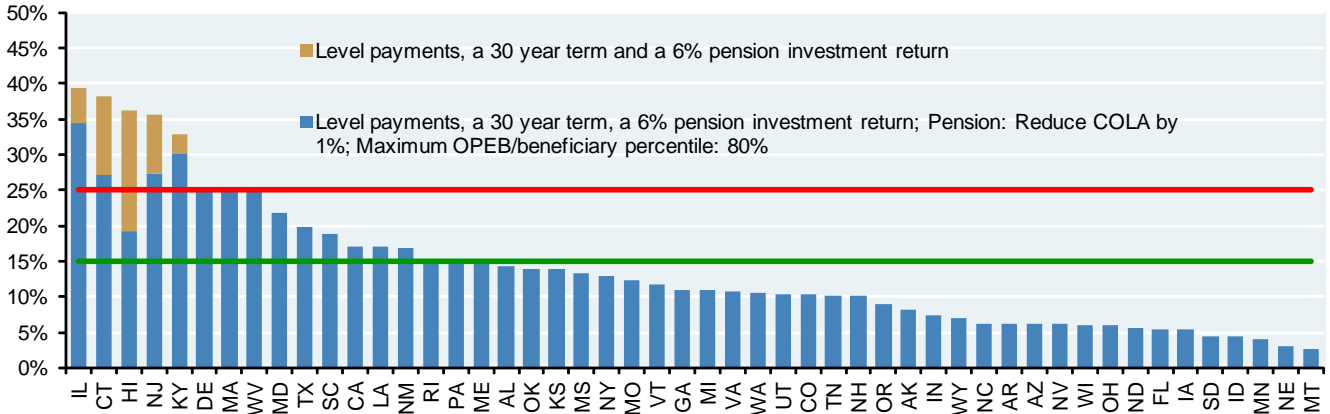
<sup>10</sup> **OPEB and ACA.** How might OPEB costs decline, other than via the ways described in Appendix C? An April 2014 article in *Government Finance Review* by PFM Group (a consultancy to state and local governments) describes how the implementation of the Affordable Care Act may allow states to reduce OPEB liabilities. For instance, insurance exchanges may provide alternative ways for states to provide retirees not yet eligible for Medicare with health insurance (especially for those retirees eligible for federal subsidies). Other ACA provisions may reduce the cost of prescription drug coverage for retirees now receiving Medicare.



To summarize, in the next step we analyze the impact of a 1% reduction in COLAs (for states that have them), and a cap on OPEB/beneficiary ratios at the 80<sup>th</sup> percentile. We also assumed that such changes would only be applied in the 5 states whose fully-loaded debt service ratio on page 12 is above 25%. For states whose ratios were below 25%, we did not model changes to pensions or OPEB (Delaware, Massachusetts and West Virginia *just* missed the 25% cutoff).

Using level payments, a revised pension return and pension/OPEB cost reductions

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

The adjustment in Hawaii is large, due to the assumed substantial decline in OPEB expense. For the other four states, the adjustments are material but still leave debt service ratios above 25%.

One last comment on pension and OPEB expense reductions. A lot of what you read about in the press relates to steps taken to reduce the *future* growth rate of liabilities. In effect, this refers to **reducing pension and OPEB costs of hours not yet worked**. Examples include changes to vesting rules, pension contributions and co-pays for new hires. This will yield benefits in terms of state finances vs. where they otherwise would have been, but most changes do not affect our analyses, since we are looking at **accumulated pension and OPEB costs related to hours already worked**.



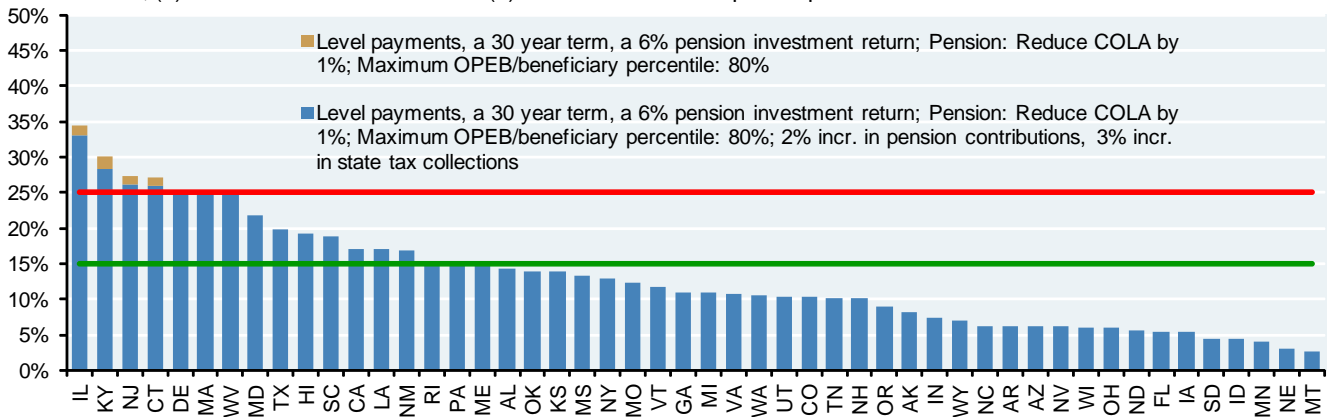
### VII. Other mitigations: worker contributions to pensions and state tax collections

Another approach states have considered: increasing worker contributions to pension plans, and increasing state income and/or sales taxes. As with the previous section, we are not analyzing the political feasibility of such steps, nor their desirability. We are simply examining their fiscal impact.

The chart below includes the COLA changes and OPEB cost limits included in the prior section. In addition, we include the impact of a 2% increase in employee pension contributions (e.g., if workers were contributing 5% of their salary, they would increase this to 7%), and a 3% increase in state tax collections<sup>11</sup>. We only apply these changes to the four states with debt service ratios still above 25% on page 15 (Illinois, Connecticut, New Jersey and Kentucky). Using this set of assumptions, the impact on debt service ratios from increased tax and worker collections in these four states is not very big. It would take much larger increases in either worker contributions and/or state tax collections to move the needle.

Level payments, revised pension return, pension/OPEB cost reductions and higher contributions/taxes

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

Debt Service Ratio, DSR

$$DSR = [I + P + O + D] / R$$

<sup>11</sup> Computationally, we modeled the increase in worker pension contributions as an offset to current pension costs ("P"), while tax increases grow the denominator "R" (i.e., it is assumed to be a general tax increase, and not dedicated solely to resolving unfunded pension and retiree health care issues).

**VIII. Conclusions**

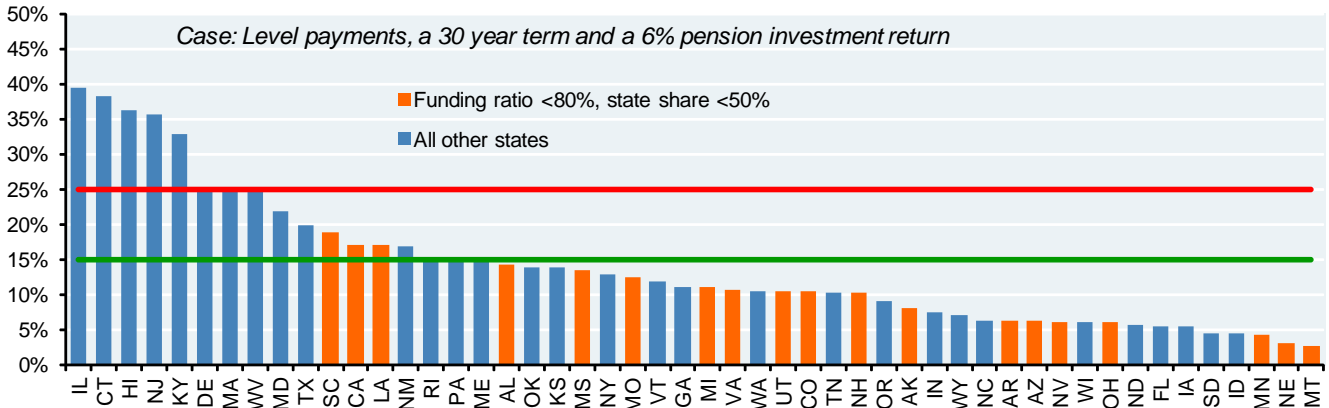
After all the scenario analysis (additional ones appear in Appendix D), the following became clear: **most states are in good shape, and this is something that I think is underreported in the national press. However, a handful of states’ revenue collections become unsustainably consumed by pension and retiree health care costs when evaluated on a fuller accrual basis.**

The catalyst for a crisis in these latter states is unclear; if a state maintains an underfunded plan for a period of years and makes contributions below ARC levels, there is no market, rating agency or regulatory force to prevent it. The reason: it would take a couple of decades for underfunded plans to actually run out of money. Perhaps the rating agencies hold the keys to any crisis; at some point, underfunded plans and a lack of mitigation may prompt a rating agency downgrade which in turn precipitates sales of the state’s bonds and a decline in confidence that can only be solved through some reworking of debt, expenses and revenues. Moody’s now appears to be factoring pension and OPEB costs into its rating actions more explicitly.

We do need to reiterate one thing regarding states with low debt service ratios. As explained earlier, most states have **partial** responsibility for pension and retiree health care systems, with cities and counties responsible for the rest. Many states look fine in our analysis, **as long as they have to just pay their share.** To get a sense for “absorption risk”, wherein states have to provide a backstop to local entities, we conclude with the following. Let’s return to the full-accrual/6% pension return case shown on page 1. In the chart below, orange bars show states where the state pension system is less than 80% funded, and where the state’s share of Annual Required Contributions into the pension is less than 50%. In other words, **where pensions are significantly underfunded and local entities have a majority of the responsibility for resolving them.** These states (South Carolina, California, Louisiana, Mississippi, Missouri, Michigan, Virginia, Colorado, Arkansas, Arizona, Nevada and Ohio) should be able to handle full-accrual payments, even assuming lower asset returns, **IF** they do not have to take ownership of local contributions as well.

States with plan funding ratios below 80%, and where the state has less than a 50% share of responsibility

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody’s; Census; Merritt; Loop Capital Markets. All data as of 2012.

**Whether local entities are collecting enough property taxes and other revenues to support their contributions to state-run plans is not part of this analysis.** Furthermore, the legal and historical obligations that states have to absorb local pension or OPEB contributions is totally unclear (at least to us), raising the importance of cities in understanding overall US municipal finance risk. Unfortunately, cities are harder to analyze than states given data quality issues (new proposed GASB regulations are not yet in place) and given the sheer number of them one would have to examine; see box below. We hope to return to this topic at some point in the future.

Michael Cembalest  
J.P. Morgan Asset Management

#### **What about the cities?**

To complete this analysis, we reviewed over 350 individual pension and retiree health care plan statements, many of which are like snowflakes in terms of their reporting consistency. To complete this analysis on cities would require exponentially more time, due diligence and interpretation. Furthermore, when thinking about the chart on the prior page, the local entities on which states rely for their pro-rata contributions are not always the largest cities in the state. In New York, for example, New York City has its own pension and OPEB plans. New York State is relying on Syracuse, Rochester, Buffalo and all other participating cities (and counties) to finance their respective shares [what's interesting about New York: the state deducts local contributions owed to state-run pension plans from state aid payable to cities]. Same goes for California, where Los Angeles and San Francisco have their own plans; the state relies on the rest of its cities to make their payments. Ohio is an example of a state which carries less than 25% responsibility for state-run plans; its cities (Columbus, Cleveland, Toledo, etc.) finance the rest, a reflection of the large share of teachers in state-run plans.

As it relates to large local government entities, a 2014 Moody's report on the largest 50 cited the following as having the highest ratio of **pension liability** to operating revenues: Chicago, Los Angeles, Cook County, Houston, Jacksonville, Dallas, Denver and Phoenix. As for retiree health care, there are fewer comprehensive studies with recent data. As per a 2013 report from Pew Research, New York City has the **largest unfunded retiree health care liability per capita** in the country, followed by Providence, Boston and Detroit. There is a large gap between these four cities and the next four: Bridgeport, Honolulu, Bridgeport and Baltimore.

#### *The issue of recent legislative changes*

We relied on actuarial assessments included in fiscal year 2012 reports from each state. If states have enacted pension or OPEB adjustments since that time, or if their prior adjustments were not reflected in fiscal year 2012 reports, then such adjustments would not be incorporated in our analysis. In December 2013, the state of Illinois passed pension reforms (COLA reductions and changes to retirement ages) designed to reduce its unfunded pension liability. However, we do not yet know the magnitude of the impact on unfunded liabilities as estimated by its actuaries, and in May 2014, an Illinois Circuit Court judge delayed the reforms pending further legal review. In all states, it may take more than one fiscal year for legislative actions to make their way through the actuarial process and adjust pension and OPEB data in state financial reports.

## Appendix A: Important disclosures on our data sources and assumptions

Our paper computes debt service ratios at the state level, excluding costs paid by subdivisions of the state (cities, counties, etc), and excluding taxes such subdivisions collect. As a result, we need the **state's share** of actual contributions, required contributions, plan assets and actuarially estimated liabilities for each state's various pension and OPEB plans. In our experience, given the non-standardized ways in which data is presented, the only way to reliably gather such data is to carefully comb through state Comprehensive Annual Financial Reports (CAFR), CAFRs for individual pension/OPEB plans and associated Actuarial Valuation Reports. We ended up reviewing over 350 individual plans; **conversations with state employees were often the only way to obtain the right information**. Even after doing so, there are still cases where state shares were unclear, in which case we made assumptions and interpretations based on our reading of state documents. Any errors or omissions resulting from such decisions are our own. Below we outline issues we confronted, assumptions we made, and observations regarding the state share question.

Many states report their share of actual and Annual Required Contributions into pensions. However:

- In 11 states, some pension plans do not provide ARCs, in which case we use Annual Pension Cost (APC) instead. In cases where both are reported, APC and ARC are usually similar.
- A few states report ARCs at the plan level and not at the state level. In these cases, we either found the state share itemized in the plan CAFR, contacted the state directly for the information, or extrapolated the state share from state vs. local employee participation levels.
- Some states report "required contributions" that may refer to legislatively set amounts rather than actuarially determined ARCs; in these cases, we used required contributions as reported since no ARC was disclosed.
- In our assessment of state pension obligations, we included "component units" such as universities when it was clear that the state had responsibility for them.

Many states report their share of actual and Annual Required Contributions into OPEB. However:

- Two states only provide Annual OPEB Cost (AOC), which we used in lieu of the ARC.
- In 9 cases, states refer to multi-employer OPEB plans, but state CAFRs and plan CAFRs do not provide state-specific ARCs. In these instances, we use the share of state employees covered or the share of actual OPEB payments to derive the state ARC.
- When an OPEB plan is a single-employer plan, or when states indicate that it has 100% responsibility for a multi-employer plan, we allocate 100% of the cost to the state. In other cases, states share responsibility for multi-employer plans with political subdivisions; some report their share of the unfunded liability, but most do not. In the latter case, we take the ratio of the state ARC to the entire plan ARC to derive the state's share of the unfunded OPEB liability.

When states take temporary responsibility for local payments into pension or OPEB plans, this is referred to as a "**special funding**" situation. We assume that special funding situations are permanent. Special funding situation examples for 2012 include:

- Alabama (Judges Retirement Fund), Illinois (Teachers and State University Retirement Systems) Maine (OPEB), Massachusetts (Teachers Retirement System), North Carolina (Firemen Pension Fund and National Guard Pension Fund), New Jersey (Teachers and Consolidated Police & Firemen Pension Fund), Tennessee (OPEB), Texas (Teachers and Employee Retirement Systems), Vermont (Pension and OPEB), Washington (Police and Fire Retirement System), West Virginia (OPEB)

We still have significant questions regarding state shares or other reported data from:

- **Pension plans:** the entire pension system of North Dakota
- **OPEB plans:** Montana State Healthcare Plan, North Dakota Retiree Health Insurance Credit Fund, South Carolina Retirement Health Insurance, West Virginia Retiree Health Benefit Trust

Some of the confusion should clear up in 18-24 months when states and cities will presumably comply with new GASB reporting standards. This should make it easier to obtain the normal cost component of the ARC for pensions and for OPEB, the state's share of the ARC and plan assets / liabilities, and underlying assumptions used to compute them.

**Appendix B: Debt supported by tax and other general revenues**

Our debt service numerator includes a term for interest expense on bonds. Since the denominator includes state tax and general revenue collections, we only want to include bonds whose repayment is sourced from these collections. The table below describes the approach we have used to obtain “net tax-supported debt” for each state, as of the end of 2012. Examples of debt we do not include, since repayment does not primarily originate from the State’s General Fund: toll road revenue bonds, water and sewer bonds backed by operational revenues, special assessment bonds and other bonds paid by sources other than taxes or General Fund revenues.

**Debt Service Ratio, DSR**  
 $DSR = [I + P + O + D] / R$

**Description of Net Tax-Supported Debt**

Types of included debt:	Types of excluded debt:
G.O. debt paid from statewide taxes and fees	Self-supporting G.O. debt with an established history of being paid from sources other than taxes or general revenues
Appropriation backed bonds	Moral obligation debt with an established history of being paid from sources other than taxes or general revenues
Lease revenue bonds	Tobacco securitization bonds, with no state backup
Special tax bonds secured by statewide taxes and fees	Unemployment insurance obligation bonds
Highway bonds, secured by gas taxes and DMV fees	Debt guaranteed, but not paid, by the state
GARVEE highway bonds	Special assessment bonds
Lottery bonds	Revenue bonds of state enterprise (ex. Toll roads)
Moral obligation debt paid from statewide taxes and fees	
Capital leases	
P3's with state concession obligation	
Pension obligation bonds	

Source: Moody's.

In addition to bonds, some states have large negative balances in their General Funds. If we had included such balances as additional bonded debt, the ratios for states with large negative Fund balances relative to bonds (e.g., California, West Virginia and Illinois) would have been 1% higher.

## Appendix C: Retiree health care/OPEB definitions and trends

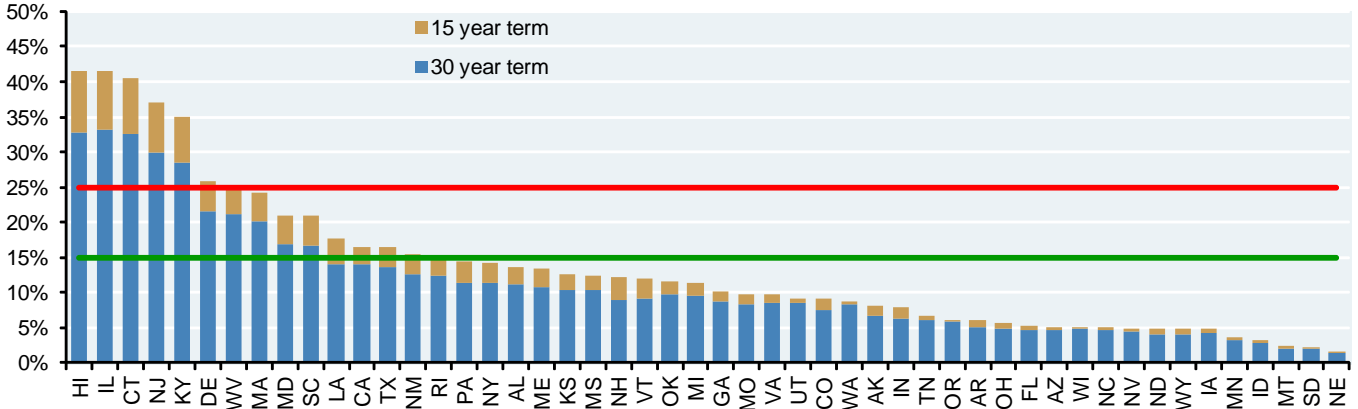
- Retiree health care coverage is referred to as OPEB, which stands for Other Post-Employment Benefits. States are very heterogeneous in terms of what they offer (i.e., the degree to which they cover expenses not already covered by Medicare). One measure of this dispersion can be derived by dividing the unfunded OPEB liability (as measured by each state's actuary) by the number of current pension plan beneficiaries. As shown on page 14, the range is very wide.
- How does OPEB work? OPEB benefits can take various forms: health care expenses, life insurance and long-term care. Health care expenses for state employees are typically composed of premiums for supplemental insurance, co-pays to physicians and health expenses not covered by Medicare. OPEB plans provide varying degrees of coverage for these health care expenses, and some plans provide broader supplemental insurance covering vision, dental and life insurance. One major difference among states is the breadth of coverage before beneficiaries are eligible for Medicare. Some states provide full coverage before Medicare eligibility, while others require contributions from retirees. For the former, increasing OPEB retirement ages can substantially reduce cost.
- How are OPEB liabilities valued? OPEB liabilities were mostly unknown until 2008, when GASB rules required them to be disclosed using the same general approach used for pensions (e.g., determine their present value; subtract any assets posted against them; and then determine an ARC that is composed of both a normal cost and an amount required to amortize unfunded liabilities over an assumed term at an assumed investment rate).
- Most states have not significantly prefunded their OPEB liabilities; only 11 have funding ratios over 10%, and only 3 are over 50% (Arizona, Alaska and Ohio). Thirty states contribute more than their pay-as-you-go costs, contributing to OPEB trust funds. The remaining states that offer OPEB to retirees only contribute the pay-as-you-go amount.
- **Two-thirds of respondents to surveys cited by the Center for State and Local Government Excellence indicated that they made changes to retiree healthcare in recent years**, with the most common being changes to retiree premium contributions, copayments, and deductibles. Examples include:
  - Delaware: vesting terms have been extended, and contributions were increased
  - Georgia: raised premiums, co-pays, and out-of-pocket maximums for retirees; linked its insurance subsidy program to number of years worked
  - Idaho: the state no longer covers Medicare eligible retirees or their dependents
  - Indiana: increased copayments and deductibles
  - Maryland: reduced prescription drug coverage by requiring higher copayments by retirees
  - Nevada: revamped plan through increased deductibles and beneficiary premiums, while eliminating eligibility for employees hired after 2011
  - New Jersey: costs shifted to the Federal gov't by becoming an official Medicare Part D plan
  - Ohio: increased required service for eligibility for all employees, currently phasing out all spousal coverage and Medicare Part B reimbursements
  - Pennsylvania: increased the minimum years of service for coverage eligibility
  - Utah: closed plan to employees hired after 2005; shifted increases in healthcare costs to employees and retirees
  - West Virginia: made subsidies eligible only for employees hired before July 2010; placed a cap on subsidy levels for eligible employees

### Appendix D: Scenario analysis on amortization terms, and another market correction

A report commissioned by the Society of Actuaries recommends 15-20 year amortization terms for public plans instead of longer ones used by some states. To provide a sense of the impact of this change, we show debt service ratios using 30- and 15-year terms for pension and OPEB unfunded liability amortization, using the discount rates assumed by each plan. In general, the more underfunded a state is, the greater the additional cost when shortening the amortization term. When using 15-year terms and a 6% investment return, the ratios rise by an additional 7-10% for the worst 5 states.

#### Comparison of amortization terms

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



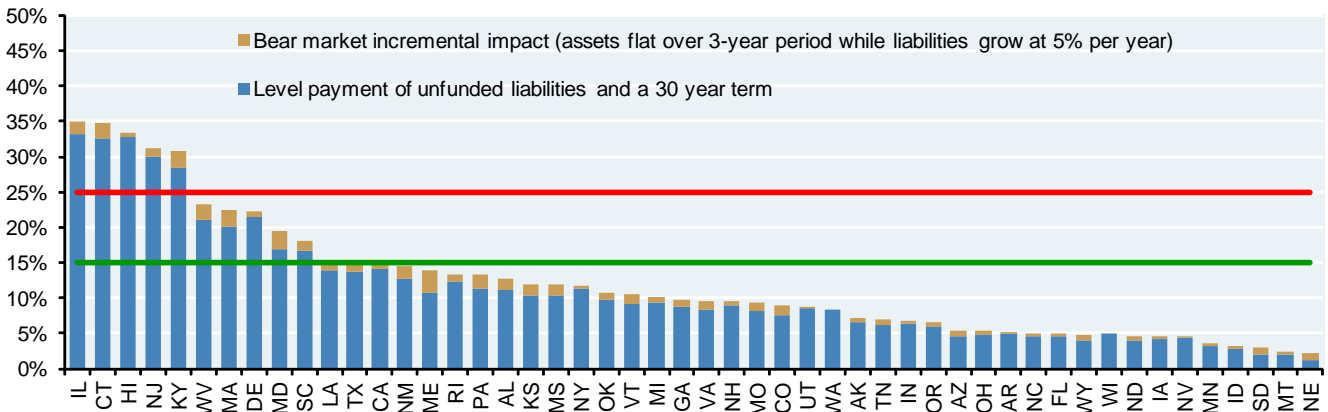
Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

### A pension system that relies heavily on risky asset returns to finance liabilities runs the risk of bear market corrections that exacerbate whatever unfunded liabilities already exist.

That's because during a correction, plan assets decline in value before growing again, while liabilities grow throughout the entire period. The last chart shows the revised ratio assuming a bear market occurs, during which liabilities grow and assets decline before recovering again three years later. In this case, the impact is modest since the resulting asset-liability gap is amortized over 30 years.

#### Impact of a bear market correction

% of state revenue collections required to pay (a) interest on bonded debt, and the state share of (b) defined benefit plan contributions, (c) retiree health care costs and (d) defined contribution plan expenses



Sources: J.P. Morgan Asset Management; state/pension plan Comprehensive Annual Financial Reports; BEA; Pew Research; Moody's; Census; Merritt; Loop Capital Markets. All data as of 2012.

**Acronyms**

ACA: Affordable Care Act; AOC: Annual OPEB Cost; APC: Annual Pension Cost; ARC: Annual Required Contribution; BEA: Bureau of Economic Analysis; CAFR: Comprehensive Annual Financial Report; COLA: Cost of living adjustment; DC: Defined Contribution; FASB: Financial Accounting Standards Board; GASB: Governmental Accounting Standards Board; GO: General Obligation; OPEB: Other post-employment benefits

**Sources.** The 2014 Moody's report listed below is an excellent resource for those looking to understand the history of public and private pension plans, the differences between FASB rules on corporate pensions and GASB rules on public pensions, and part of the narrative on how current unfunded liabilities developed.

*"COLA cuts in State/Local Plans"*, Alicia Munnell, Jean-Pierre Aubry, and Mark Cafarelli, Center for Retirement Research at Boston College, May 2014

*"Divergent Pension Risks: US Corporates Will Remain in Far Better Position than State and Local Governments"*, Alfred Medioli, Wesley Smyth, Timothy Blake, Anne Van Praagh, Moody's, April 2014

*"Developing a Pension Funding Policy for State and Local Governments"*, David Kaush and Paul Zorn, Gabriel Roeder Smith & Company, January 2012

*"Managing Public-Sector Retiree Health-Care Benefits under the Affordable Care Act"*, Nadol, Link and Benson (PFM Group), Government Finance Review, April 2014

*"Milliman 2013 Public Pension Funding Study"*, Rebecca Sielman, Milliman, November 2013

*"Policy options for state pension systems and their impact on plan liabilities"*, Robert Novy-Marx (Rochester) and Joshua Rauh (Stanford), Journal of Pension Economics and Finance, April 2011

*"Report of the Blue Ribbon Panel on Public Pension Plan Funding"*, An Independent Panel Commissioned by the Society of Actuaries, February 2014

*State Comprehensive Annual Financial Reports, Fiscal Year 2012*

*"State Expenditure Report – Examining Fiscal 2011-2013 State Spending"*, National Association of State Budget Officers, 2013

*"State OPEB Liabilities Decline Slightly, But Continue To Vary Widely Among U.S. States"*, David Hitchcock and John Sugden, Standard & Poor's, November 2013

*"Strengthening the Security of Public Sector Defined Benefit Plans"*, The Blinken Report, Donald Boyd and Pete Kiernan, The Nelson A. Rockefeller Institute of Government, January 2014

*"Stress Testing Public Pension Funds"*, Bridgewater Daily Observations, April 9, 2014

*"US Municipal Governments Can Leverage Federal Medicare to Lower OPEB Costs"*, Marcia Van Wagner, Moody's, March 2014

*"US state and local pensions: Off-balance sheet liabilities and the municipal bond market"*, Alexander Roever and Joshua Rudolph, J.P. Morgan Securities – Municipal Markets Strategy, May 2011

Presentation from Gabriel, Roeder Smith & Company to the Florida Government Finance Officers Association 2013 Annual Conference, June 2013



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## MICHAEL CEMBALEST

*Chairman of Market and Investment Strategy*  
J.P. Morgan Asset Management

Michael Cembalest is Chairman of Market and Investment Strategy for J.P. Morgan Asset Management, a global leader in investment management and private banking with \$1.6 trillion of client assets under management worldwide (as of December 31, 2013). He is responsible for leading the strategic market and investment insights across the firm's Institutional, Funds and Private Banking businesses.

Mr. Cembalest is also a member of the J.P. Morgan Asset Management Investment Committee and a member of the Investment Committee for the J.P. Morgan Retirement Plan for the firm's more than 250,000 employees.

Mr. Cembalest was most recently Chief Investment Officer for the firm's Global Private Bank, a role he held for eight years. He was previously head of a fixed income division of Investment Management, with responsibility for high grade, high yield, emerging markets and municipal bonds.

Before joining Asset Management, Mr. Cembalest served as head strategist for Emerging Markets Fixed Income at J.P. Morgan Securities. Mr. Cembalest joined J.P. Morgan in 1987 as a member of the firm's Corporate Finance division.

Mr. Cembalest earned an M.A. from the Columbia School of International and Public Affairs in 1986 and a B.A. from Tufts University in 1984.

