Richard A. White, Jr.
Retirement Administrator

Telephone: (707) 463-4328
(707) 467-6473
Fax: (707) 467-6472

MENDOCINO COUNTY
EMPLOYEES' RETIREMENT ASSOCIATION
625-B KINGS COURT
UKIAH, CALIFORNIA 95482-5027

Date: August 21, 2013
To: Board of Retirement
From: Richard White, Retirement Administrator
Subject: Communications to the Board of Retirement

Recommended Action: Informational Item Only

Discussion: Included are articles and items of interest which relate to public pension funds and are presented to the Board as informational items.

1. On Detroit, General Obligations and Public Pensions. Municipal Securities Research by Wells Fargo Securities. (July 19, 2013). 'Provides clarity on the complexity of the issues involved in Detroit's bankruptcy filing, including a comment on how few municipalities actually file for bankruptcy.' (GFOA Newsletter)

2. State Pension Update: Credit Risk of Pensions Continues. Fitch Ratings. (July 16, 2013). Fitch found that 'most states are well positioned to address the pressures they face from unfunded pension liabilities and rising contributions.' (GFOA Newsletter)

3. A Bumpy Road Lies Ahead for U.S. Public Pension Funded Levels. Standard & Poor's Rating Services. (July 16, 2013). ' Found that U.S. state pensions are showing some signs of stabilization, but significant improvement in funded levels will take many more years.' (GFOA newsletter)

4. Anchor to Windward or Albatross? Sea of Change in Fixed Income. Callan Investments Institute. (June 26, 2013). Brief summary of key insights from the presenters at the recent Callan Associates June Regional Workshop in San Francisco.

July 19, 2013

WELLS FARGO SECURITIES

Municipal Securities Research

Municipal Commentary

Natalie Cohen, Senior Analyst
natalie.cohen@wellsfargo.com
(212) 214-8014

On Detroit, General Obligations and Public Pensions

We are not at all surprised about Detroit's bankruptcy filing. Throughout the emergency management process, the prospect for multiple lawsuits piled up, so it was only a matter of time before one creditor filed a suit that would force the city to protect itself. What the filing does is put a "stay" on such lawsuits, creating breathing room for the city, so to speak. The pension funds sued to block the city from drastically reducing their benefits, likely pushing the city over the edge.

In a dark way, we believe this is as the best of both worlds. Michigan has the strictest state oversight law on the books, giving the emergency manager (EM) extraordinary authority over city operations. Detroit's EM, Kevyn Orr, had stopped payments on the city's "pension obligation certificates", lumped together voter-approved unlimited tax bonds in a basket of "unsecured" obligations with limited tax securities, pension and health care obligations and offered $0.10 on the dollar. On the other hand, the first settlement to come out of the negotiations was a $0.75 on the dollar offer to the swap counterparties with a proposed "debtor-in-possession" (DIP) financing that may, if structured like other DIP or "DIP-like" financings, offer a "super priority lien" to the swap creditors.

The EM law (Act 436) is unique to the state of Michigan, and as a result, resolution of fiscal distress in other states would look different. In addition, unlike the great majority of the rest of the municipal market, Detroit is under extreme financial and operational duress.

Outside the umbrella of bankruptcy, a multitude of one-by-one cases could have unintentionally favored one party over another. A bankruptcy judge at least would measure the EM's proposal in light of fair and equitable solutions for all creditors. In addition, a judge would evaluate the proposals against federal and state laws governing securities, contracts and labor. Until the filing, the EM was essentially performing both functions. While this type of restructuring outside bankruptcy may be common in cases of corporate distress, it is unprecedented in the municipal market. An impartial judge could add a measure of validity to the proposals and their solutions.

Chapter 9, the section of the federal bankruptcy code that applies to municipalities does not give a judge as much authority as in Chapter 11. It is up to the debtor (Detroit in this case) to make a proposal for feasible reorganization, for creditors to react and for the judge to evaluate the proposals in light of state and federal law and previous decisions. So, the EM can continue to advocate for his proposal.

Some in the press have argued that bankruptcy judges have little experience with Chapter 9 and that the process is extremely costly. Well, in our view, few bankruptcy attorneys (including Mr. Orr) have much experience with municipal bankruptcy either. At the end of the day, only a few experts do, since there have simply been so few municipal bankruptcy filings. As far as cost, there were likely to be numerous individual creditor lawsuits which would have been costly too, and perhaps the progress made through the emergency management process to date will help expedite the bankruptcy.

[1] We refer readers to a number of our writings on this subject, which may help illuminate some of the issues:

- *Intergovernmental Theater: Spotlight on Michigan*, Natalie Cohen, January, 2013
- *Public Pension Update*, Natalie Cohen and Roy Eappen, May, 2013
- *The Nuanced Municipal Market: Navigating Choppy Waters*, Natalie Cohen and Roy Eappen, July 2012
- *Broken Bench*, Natalie Cohen and Roy Eappen, November 2011

In this context, we see a number of themes that investors should be considering, and we highlight these in the following commentary. The EM's proposal to creditors, and now bankruptcy filing, is complex and nothing short of an attempt to rebuild an entire city of 700,000. In this commentary we only scratch the surface and focus on some issues that we believe affect investors.

- **General obligation unlimited tax (GOULT)** bonds, particularly voter-approved and designated to specific projects have historically received favored status, legally and through industry practice, as well as by rating agencies. We do not see this type of treatment in the EM's proposal to creditors—and as a result, there would likely have been litigation on this point. We hope the judge is able to evaluate the merits of the general obligation pledge in the case.
- **Unfunded pension liabilities** are claimed to be 5x higher than the city's actuaries reported in their latest valuation. To date, there is no transparency as to how this figure was calculated. To the extent this figure continues to be used in negotiations, pro rata shares offered to the basket of "unsecured" creditors would not only be re-balanced in favor of retirees, but it raises, in our view, questions about appropriate historical disclosure under securities laws. We see the clash between retiree benefits and securities protection popping up elsewhere: in California bankruptcies and in rating agency downgrades. (Resolution of these complex issues is as varied as the states, with many finding positive, cost-saving solutions. Having the bankruptcy court address the issue should add knowledge to a very limited playbook.)
- We discuss the importance for investors of having **a lien on collateral or on special revenues**, particularly among distressed credits. This benefit is evident from the first agreement to emerge with the swap counterparties. So far, "special revenues," such as water and sewer systems, have been exempt from the "automatic stay" on bankruptcy, and we have no reason to believe that Detroit's water and sewer bonds would receive different treatment. Decisions in the Jefferson County case affirmed this point — although of course, the special revenue systems need to be cash flow positive enough to pay debt service, which Detroit's water and sewer are, while Jefferson County's are not.
- **The water and sewer systems** are currently financially functional, modestly improving operationally and serve a large metropolitan area outside the city. The EM proposed re-vamping the security so that the city would receive transaction payments as part of operating expenses and ahead of debt service. Embedding transfers to the city in this way is unconventional (typically, these are paid after debt service) and could limit future system flexibility. For example, weather could affect revenues, and unexpected maintenance could affect spending, while hard-wiring payments to the city could affect debt service coverage. For a system just now coming out of environmental sanctions, a low-grade rating could be costly and hamper future capital improvements. We are also unclear how this proposal would be accomplished and why suburban customers would agree, and we expect litigation. On this point, we are happy to have a judge in the picture who may clarify the system's position.

General Obligation Unlimited Tax Bonds

Voter-approved, unlimited tax general obligations have always been treated as having higher standing by rating agencies and investors than General Fund obligations. General Fund obligations are typically paid from any available revenues and do not have a specific tax pledge associated. Rating agencies routinely differentiate GOULT bonds by giving them higher ratings than General Fund obligations. This seems particularly pertinent in the case of Detroit where voters approved an unlimited tax for bonds specifically slated to finance a list of the city's public projects. It was also not entirely clear to us how offering $0.10 on the dollar would directly benefit the city since the GOULT tax was voted for the specific purpose of paying debt service. In theory, (if accepted of course) this could lower taxpayers' burden, but we do not believe the GOULT taxes could be used to pay for general operations.

The face of the 2004 Detroit official statement for general obligation unlimited tax bonds says "The Unlimited Tax Bonds are full faith and credit unlimited tax general obligations of the City duly authorized by the City's voters and secured by a pledge of the full faith and credit of the City. The City is authorized and required by law to levy and collect ad valorem taxes without limitation as to rate or amount upon all taxable property in the City to pay the principal of and interest on the Unlimited Tax Bonds when due." This is standard language for general obligation unlimited tax obligations.

In addition, Act 436 states: "The financial and operating plan shall provide for all of the following: ...The payment in full of the scheduled debt service requirements on all bonds, notes, and municipal securities of the local government, contract obligations in anticipation of which bonds, notes and municipal securities are issued, and all other uncontested legal obligations." (141.1551 Sec. 11(1)(b))

It is ironic that the recently approved Basel III capital charges for banks give less weight to municipal general obligations than to revenue bonds. Perhaps the writers of Basel III should have a conference call with the EM.

It is important for investors to note that most prospectuses for general obligation bonds carry the caveat that bondholders' remedies may be limited by certain events such as bankruptcy. The Detroit Series 2004 unlimited general obligation bond prospectus states: "The rights and remedies of owners or holders of the bonds and the enforceability of the bonds, the Unlimited Tax Resolution....may be subject to and limited by bankruptcy, insolvency, reorganization, moratorium, fraudulent conveyance, or similar laws affecting the enforcement of creditors' rights generally heretofore or hereafter enacted to the extent constitutionally applicable...." Similar language is included in high-grade general obligation transactions as well.

Given the way the EM's proposal is structured, we believe litigation to resolve the standing of the general obligation unlimited tax would have been inevitable. Here too, we hope the judge will provide clarity.

Pension and Retiree Health Obligations

The EM's report to creditors comments that the city's actuarial valuation of its unfunded actuarial accrued liability (UAAL) is substantially understated. Rather than $644 million as calculated in the city's last actuarial report (2011), the liability presented in the EM's report is $3.5 billion. Other Post Employment Benefits are pegged at $5.7 billion. The EM's report states that there was a reduction of 1% in the discount rate to arrive at the $3.5 billion. That math, in our view, does not get us from $644 million to $3.5 billion. We were unable to obtain a copy of the report and rely instead on reports in the *Detroit Free Press*, *Pensions and Investments*, the original actuary's statements and statements by the Police and Fire Retirement System. Those sources commented that the Milliman report was a "very rough preliminary guesstimate" that revised funding levels to 32% from 87% for the General Retirement System and to 50% from 102% for the Fire and Police Fund. The EM has a review underway, and we hope the outcome will provide greater clarity.

Not surprisingly, the city's actuaries objected. They issued a press release criticizing the change as did the city's police and fire union. Pension plan trustees have set aside litigation funds and filed suit against the governor to block a bankruptcy filing. How retiree obligations are quantified is critical to the outcome of the restructuring. The dramatic increase in pension obligations critically re-balances the pro-rata share of whatever funds might ultimately be available for bondholders in favor of the retirement beneficiaries.

On the one hand, presenting outsized obligations might have been viewed as a strategic assist to negotiators in gaining concessions from the retirees and pension board. On the other hand, we are not sure why the unions representing the beneficiaries are objecting to this jump—since they stand to benefit from a greater pro-rata share of whatever gets agreed to in a settlement. We also question whether there may be a securities law disclosure issue for bondholders who purchased the bonds with the understanding that the pensions were reasonably well-funded—but now learn that the liabilities are 5x the amount.

There is significant "wiggle" room in many pension plans, including Detroit's. The city is notorious for the "13th paycheck", as well as retro-active benefits that have been granted to retirees. In Michigan, unlike in California, the contractual obligation extends to benefits already accrued, but not "to be accrued" (i.e., work already performed rather than to-be-performed). But what exactly constitutes the contract in many plans is unclear and is only now beginning to be analyzed and litigated. Many states and municipalities have made adjustments that fall within the bounds of the pension contract, and courts have begun to build the "playbook" of what defines the actual contract. For example, Colorado eliminated the cost of living adjustment (COLA), which was initially upheld by the court as not part of the contract. On appeal, the decision was reversed, but *how much of a COLA* is granted was determined not to be part of the contractual obligation. While not the optimal outcome, the state is still able to achieve significant savings by offering a less expensive COLA.

Of interest, Act 436 (the new Michigan emergency management law that went into effect in March) gives an EM authority to take over management of a pension fund that is not actuarially funded at a level of 80% or more. The law excludes the "net value of pension bonds or evidence of indebtedness" when assessing the funding level (141.1552 Sec. 12 (1) (m)). This provision is curious since the pension certificate proceeds were irrevocably deposited with the pension trust. (We surmise that this was put into the Act to make it easier for an EM to take over management.) The EM has already embarked on investigations of pension management but has not, at this writing deposed any of the plan trustees.

CalPERS has Re-cast Obligations Too

We have also seen a dramatic re-cast of the unfunded pension liability in California among some members of the CalPERS system. In the San Bernardino, California

---

[2] Public pension systems typically smooth the value of assets over a five year period to make annually required payments more predictable and mitigate market volatility. The government accounting standards board (GASB) has moved toward using market value of assets, more common in private sector actuarial assessments.

bankruptcy case, CalPERS changed its estimate of "all obligations owed to the system" from the city's actuarial estimate of about $143 million to $319 million. Some of the difference is explained by the actuarial use of "asset smoothing" vs. using the market value of assets as well as using a lower discount rate.[2] Still and yet, the difference here is just over a 2X multiple of the actuarially determined value and not 5X as in the case of Detroit. We also point out that CalPERS, as well as a group of academic thinkers on this topic, assumes a "termination" value. That is, it assumes there would be no further pay-in by the plan sponsor (municipality), which we find an unrealistic assumption. Even if a municipality terminates its relationship with the state pension system, municipalities are on-going concerns, and it is hard to imagine contributions from both employees and employers going to zero.

The Importance of a Lien

The importance of collateral or a statutory pledge of revenues was clear to swap counterparties in Detroit. The swap was structured with a termination provision that triggered a rating downgrade to below investment grade. When that trigger was tripped in 2009, the city agreed to secure the swap with its wagering taxes to avoid paying the termination fee. This agreement has now put the swap counterparties in a stronger position than the general obligation bondholders and the pension obligation certificate holders themselves[3]. (Originally, certificate payments were at the top of the payment waterfall.) However, in a rising interest rate environment, the agreement may not turn out to have been such a good deal for the city—the purported main goal of the restructuring. (The EM's report calculated a swap termination amount as of May 31st, prior to a significant rate rise in the fixed income markets in June.)

The importance of having a lien has not been lost on CalPERS, one of the largest pension plans covering public employees of many California municipalities. In April, the CalPERS board approved a staff proposal to sponsor legislation that would "provide CalPERS with a present lien on all assets of a contracting public agency in the amount of all obligations owed to the system." Given how late it was in the legislative calendar, there were limited prospects of immediate passage, so the pension system decided to wait until the next session to propose the bill. Current law authorizes a lien only if the plan is terminated and a city leaves the system. Needless to say, many municipalities do not have the magnitude of free and clear assets to pledge. California also has a long, post-Proposition 13 history of lease financings that are associated with specific properties. Such a proposal would likely complicate this slice of California financing.

Recommendations

News reports of the demise of general obligation bonds have been popping up and will likely become more frequent. In our opinion, such demise could not be further from the truth, but investors do need to consider circumstances where repayment of general obligation *may* be riskier.

The issues discussed here relate to ***distressed*** or near-distressed municipalities and not the broader market—which retains its historical strength despite adverse fiscal conditions (and despite naysayers). Our advice to investors is straightforward: if you are going to consider low-grade municipal investments, find out whether you have a lien on a special revenue or dedicated tax. These include water, sewer, electric charges, sales taxes, special assessments and other pledged revenues (and structures where collateral is pledged). We also offer a cautionary note to investors in variable-rate securities of low-grade borrowers. Investors should press for disclosure about swap termination provisions.

Alternatively, if you are investing in lower-grade general obligation bonds, we recommend you check that they are issued in one of the five states with a statutory lien on taxes for general obligations, which provides added strength, and that your investment has this feature. These states include: California, Florida (for bonds issued under the Advanced Refunding Law), Colorado, Louisiana and Rhode Island.[4]

High-grade general obligation bonds are not immune to pension tensions, and we could envision some ratings migration downward in cases where pension obligations are significantly underfunded. In April, 2013, Moody's put 29 local governments in rating categories "Aa" and above under review for significantly higher levels of unfunded pension obligations than other municipalities in the same rating categories. (The local list of 29 includes Las Vegas, Nev. and Virginia, Minn., which are rated A1 and A2 respectively.) The agencies have downgraded a number of borrowers citing high, unfunded pension liabilities as a driver—notably Illinois, Pa. and the commonwealth of Puerto Rico (although Moody's has

[3] The EM proposal states that they are looking into the validity and enforceability of the POC's. Indulge our editorializing: After so many years of paying on the certificates one would think there would be a statute of limitations — or that validation suit would have already taken place. If deemed invalid, would the assets deposited in the trust then come back to certificate holders? To the city? Perhaps this is why POC proceeds are excluded from the funding assessment in Act 436...(We cannot resist pointing out the irony that Moody's gave the certificates a "Aa1" global scale rating at issuance.)

[4] See "Key Credit Considerations for Municipal Governments in Bankruptcy", Moodys Investors Service, May 2012.

said that its new approach to evaluating the risk of unfunded pensions would not result in *state* rating downgrades). On June 15, Moody's downgraded Cincinnati's general obligation rating from Aa1 to Aa2 and the non-tax revenue bonds (and Convention Facilities Second-Lien Revenue, Series 2004) from Aa2 to Aa3, mainly due to underfunded pension and retiree healthcare benefits and their increasing budgetary burden. On July 17, the agency lowered the Chicago's ratings by three notches, citing the pension liability (Aa3 to A3 on the general obligation and Aa2 to A1 on the water/sewer senior; Aa3 to A2 on the water/sewer junior).

And Back to Detroit

Ultimately, we believe the issue of municipal solvency is a question of management of resources. For example, despite Stockton, Calif.'s on-going bankruptcy case, the City Council this week approved 7-0 to put a $0.075 sales tax on the ballot this November to hire more police to reduce crime. Whereas corporations can be liquidated in bankruptcy, municipalities cannot and in this is a key difference. But municipalities "sell" a product too — and that product is an environment that makes a city or town or state a desirable place to live, and in which to do business and invest.

Detroit has had periodic episodes of mismanagement and corruption stretching back to the beginning of the last century, and this is the third time in recent history that the city is rated below investment grade. We hope this time will be different. Other cities have overcome the disastrous unrest of the late 1960s and suburban flight of the 1970s, and we believe Detroit can as well. Perhaps it is time to consider radically different forms of governance for the city. One small, but positive example, in our view is the extensive proliferation of charter schools within the city's school system—a testimony to the indomitable drive of residents to create new governing structures to offer the next generation something better.

Additional information is available on request.

This report was prepared by Wells Fargo Securities, LLC.

About Wells Fargo Securities, LLC
Wells Fargo Securities, LLC is a U.S. broker-dealer registered with the U.S. Securities and Exchange Commission and a member of the New York Stock Exchange, the Financial Industry Regulatory Authority and the Securities Investor Protection Corp. Wells Fargo Bank, N.A. and Wells Fargo Securities, LLC are each registered with the U.S. Securities and Exchange Commission and the Municipal Securities Rulemaking Board as municipal securities dealers.

Important Information for Non-U.S. Recipients

EEA
The securities and related financial instruments described herein may not be eligible for sale in all jurisdictions or to certain categories of investors. For certain non-U.S. institutional reader (including readers in the EEA), this report is distributed by Wells Fargo Securities International Limited ("WFSIL"). For the purposes of Section 21 of the UK Financial Services and Markets Act 2000 ("the Act"), the content of this report has been approved by WFSIL a regulated person under the Act. WFSIL does not deal with retail clients as defined in the Markets in Financial Instruments Directive 2007. This research is not intended for, and should not be relied upon, by retail clients. The FSA rules made under the Financial Services and Markets Act 2000 for the protection of retail clients will therefore not apply, nor will the Financial Services Compensation Scheme be available.

Australia
Wells Fargo Securities, LLC is exempt from the requirements to hold an Australian financial services license in respect of the financial services it provides to wholesale clients in Australia. Wells Fargo Securities, LLC is regulated under U.S. laws which differ from Australian laws. Any offer or documentation provided to Australian recipients by Wells Fargo Securities, LLC in the course of providing the financial services will be prepared in accordance with the laws of the United States and not Australian laws.

Hong Kong
This report is issued and distributed in Hong Kong by Wells Fargo Securities Asia Limited ("WFSAL"), a Hong Kong incorporated investment firm licensed and regulated by the Securities and Futures Commission to carry on types 1, 4, 6 and 9 regulated activities (as defined in the Securities and Futures Ordinance, "the SFO"). This report is not intended for, and should not be relied on by, any person other than professional investors (as defined in the SFO). Any securities and related financial instruments described herein are not intended for sale, nor will be sold, to any person other than professional investors (as defined in the SFO).

Japan
This report is distributed in Japan by Wells Fargo Securities (Japan) Co., Ltd, registered with the Kanto Local Finance Bureau to conduct broking and dealing of type 1 and type 2 financial instruments and agency or intermediary service for entry into investment advisory or discretionary investment contracts. This report is intended for distribution only to professional investors (Tokutei Toushika) and is not intended for, and should not be relied upon by, ordinary customers (Ippan Toushika).

The ratings stated on the document are not provided by rating agencies registered with the Financial Services Agency of Japan (JFSA) but by group companies of JFSA-registered rating agencies. These group companies may include Moody's Investors Services Inc, Standard & Poor's Rating Services and/or Fitch Ratings. Any decisions to invest in securities or transactions should be made after reviewing policies and methodologies used for assigning credit ratings and assumptions, significance and limitations of the credit ratings stated on the respective rating agencies' websites.

Important Disclosures Relating to Conflicts of Interest and Potential Conflicts of Interest

Wells Fargo Bank, N.A., Wells Fargo Securities, LLC and certain of their affiliates are registered municipal securities dealers and may trade the securities named herein on a principal or agency basis, may act as underwriter for one or more of the issuers or securities named herein and may receive compensation for such services or other investment banking services provided to one or more of the issuers named herein.

Wells Fargo Securities, LLC does not compensate its research analysts based on specific investment banking transactions. Wells Fargo Securities, LLC research analysts receive compensation that is based on and affected by the overall profitability of their respective department and the firm, which includes, but is not limited to, investment banking revenue.

Analyst's Certification
The research analyst(s) principally responsible for the report certifies to the following: all views expressed in this research report accurately reflect the analysts' personal views about any and all of the subject securities or issuers discussed; and no part of the research analysts' compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the research analyst(s) in this research report.

This report, IDs, and passwords are available at www.wellsfargoresearch.com

Securities discussed herein may be rated below investment grade and should therefore only be considered for inclusion in accounts qualified for speculative investment.

This report is for your information only and is not an offer to sell, or a solicitation of an offer to buy, the securities or instruments named or described in this report. Interested parties are advised to contact the entity with which they deal, or the entity that provided this report to them, if they desire further information. The information in this report has been obtained or derived from sources believed by Wells Fargo Securities, LLC, to be reliable, but Wells Fargo Securities, LLC does not represent that this information is accurate or complete. Any opinions or estimates contained in this report represent the judgment of Wells Fargo Securities, LLC, at this time, and are subject to change without notice. For the purposes of the U.K. Financial Services Authority's rules, this report constitutes impartial investment research. Each of Wells Fargo Securities, LLC, and Wells Fargo Securities International Limited is a separate legal entity and distinct from affiliated banks.

SECURITIES: NOT FDIC-INSURED * NOT BANK-GUARANTEED * MAY LOSE VALUE

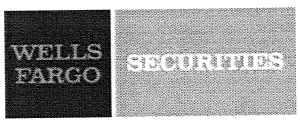
Global Head of Research, Economics & Strategy

Diane Schumaker-Krieg, Managing Director, Global Head of Research, Economics & Strategy	diane.schumaker@wellsfargo.com	(704) 410-1801 (212) 214-5070

Municipal Securities Research

Natalie Cohen, Managing Director	**Head of Municipal Research**	natalie.cohen@wellsfargo.com	(212) 214-8014
George Huang, Director	**Healthcare**	george.huang@wellsfargo.com	(212) 214-5061
Randall Gerardes, Vice President	**Infrastructure**	randall.gerardes@wellsfargo.com	(212) 214-5026
Roy Eappen, Associate	**General Municipal Analyst**	roy.eappen@wellsfargo.com	(212) 214-8045

Available on Bloomberg at WFRE and MarkitHub
Available at www.wellsfargoresearch.com. You can request a Web site ID and password directly on this site.
To have future reports emailed to you directly or to request access to WFRE via Bloomberg, send a request to wellsfargo.research@wellsfargo.com



State Pension Update

Credit Risk of Pensions Continues

Special Report

Funded Ratios Declining, But at a Slower Pace

Updates States' Pension Metrics: This report updates metrics previously published by Fitch Ratings. These include Fitch-adjusted funded ratio metrics for major statewide plans, and a measurement combining states' net tax-supported debt and the adjusted unfunded pension obligation attributable to states.

Reforms Underway: Pensions remain a growing pressure for numerous states' budgets. The vast majority of states with pension pressures are pursuing reforms to improve the sustainability of their plans and Fitch believes that most states are well positioned to address the pressures they face from unfunded pension liabilities and rising contributions. In only a few cases are reforms having an immediate, beneficial impact on funded ratios.

Funded Ratios Continue to Fall: The reported funded ratios for most major statewide plans continue to decline, although the rate of the decline is slowing. Numerous factors contribute to the ongoing erosion including pensions' continued absorption of market losses from the 2008–2009 recession and the impact of state reform actions.

Market Value Ratios Lower: Funded ratios on a market value basis remain below those on an actuarial value basis for the vast majority of plans based on the most recent data (2012 for most plans), suggesting continued pressure on actuarial funded ratios. Plans with a June 30 valuation date are likely to benefit materially from the stronger market performance in fiscal 2013.

Investment Return Assumptions Lower: More than one-half of major statewide plans have lowered their investment return assumption (IRA) since the downturn, a positive step in Fitch's view. Fitch believes that IRAs at 8% or higher are unrealistic. Fitch adjusts the reported plan IRA to 7% to improve comparability across plans.

ARC Funding Practices Mixed: Numerous governments continue to fully fund an actuarially-calculated annual required contribution (ARC) while other governments do not. Reasons for ARC underfunding vary broadly including the timing of decision-making on budgeted appropriations compared to ARC calculations, or state actions for budget relief.

Pensions Higher than Debt: Fitch calculates a metric combining each state's net tax-supported debt and its total adjusted unfunded pension liability, including a share of cost-sharing plan liabilities, measured against personal income. The pension component of this metric is higher than debt and the range of the pension component is much wider, reflecting the disparate funding condition in states' pensions, whether states cover local teachers or other nonstate employees, and other factors.

GASB Changes Affect Disclosure: Fitch believes that the new Government Accounting Standards Board (GASB) standards, covering pension systems themselves (effective June 2013) and governments with pensions (effective June 2014) represent a net improvement in disclosure. Given the extensive changes to reported pension data being implemented with the new standards, Fitch expects to review its approach following the new standards' implementation.

Related Research

Local Government Pension Analysis (April 2013)

Improving Comparability of State Liabilities (March 2012)

Enhancing the Analysis of U.S. State and Local Government Pension Obligations (February 2011)

Analysts

Douglas Offerman
+1 212 908-0889
douglas.offerman@fitchratings.com

Laura Porter
+1 212 908-0575
laura.porter@fitchratings.com

Richard Raphael
+1 212 908-0506
richard.raphael@fitchratings.com

Updating Prior Reports

The primary purpose of this report is to update data published by Fitch in its previous reports on the defined benefit pension systems of states. Those reports described how Fitch analyzes states' unfunded pension liabilities in the context of assigning credit ratings, including adjustments made by Fitch to supplement reported data and improve the comparability of plan liabilities.

In its analysis, Fitch reviews reported pension data disclosed by plans themselves and the sponsoring state. These include asset and liability levels, funded ratios, actual contributions compared to the actuarially determined ARC, and the actuarial and economic assumptions underlying the reported figures.

To improve comparability across states, Fitch adjusts the actuarial liabilities of pensions to reflect a 7% IRA, a level somewhat lower than the 8% or higher levels historically assumed by many plans. For cost-sharing multiple employer plans, which constitute the vast majority of state-sponsored plans, Fitch allocates a share of the system-wide liability to the state to reflect the portion of the plan's total obligation that is reported as the responsibility of the state. When not directly reported by the state, this allocation is estimated by Fitch based on the available pension data. Using these estimates, Fitch combines the adjusted unfunded pension obligations attributable to the state for all of its plans with the state's net tax-supported debt metric to provide a more comparable measure of the state's long-term liabilities.

In addition to reported plan data and Fitch-adjusted metrics incorporated in its review of pensions, Fitch also reviews the states' approach to managing pension liabilities. Since the severe market losses of 2008–2009, the vast majority of states have adopted reforms affecting benefits, assumptions, and contribution practices. In most cases, the salutary effect of reforms in improving plans' sustainability is not immediate and may be decades away. Nonetheless, Fitch views a proactive approach to managing pension challenges as a credit positive.

The GASB has announced new standards governing the accounting of pension systems (effective in fiscal years beginning after June 15, 2013) and governments providing defined benefit pensions (effective in fiscal years beginning after June 15, 2014). The new standards will materially change the data reported by plans including funded ratios, investment return assumptions, amortization of liabilities, and contributions. Fitch believes that, for the most part, the new statements will materially improve the availability, consistency, and comparability of plan data. Fitch has a few concerns about the standards, notably in the loss of a requirement to consistently report the ARC. Fitch expects to revisit its approach to analyzing pensions once the new standard is implemented.

Combined Metric for State Debt and Pensions

Median Level at 7% of Personal Income

As noted before, Fitch calculates a metric combining each state's net tax-supported debt and a share of the unfunded pension liability of statewide pension plans (adjusted by Fitch to reflect a 7% IRA) as a comparative measure of each state's long term liabilities (see Appendix A). Together these liabilities are measured against a states' personal income, which represents the resource base that will ultimately cover the obligations. The median level for states' combined net tax-supported debt plus unfunded pension liabilities measures 7.0% of 2012 personal income, with a low of 1.8% (for Tennessee) and a high of 24.8% (for Illinois) for states rated by Fitch. (See chart on page 3.)

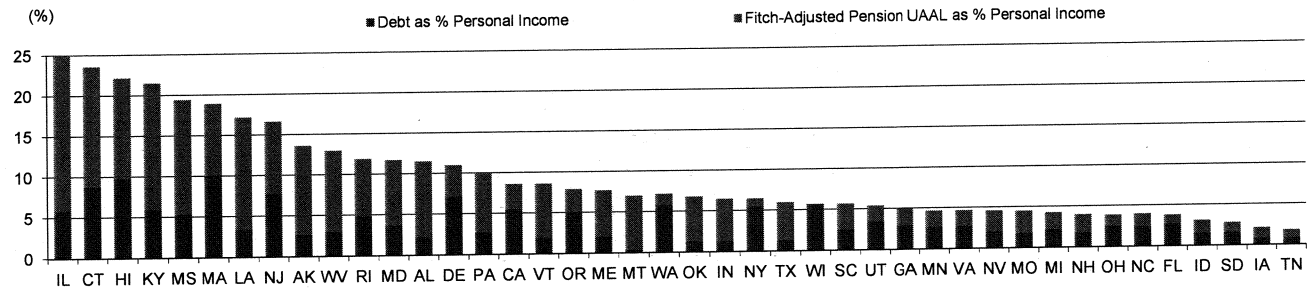
Related Criteria

Tax-Supported Rating Criteria (August 2012)

U.S. State Government Tax-Supported Rating Criteria (August 2012)

The wide range in the combined figure is primarily due to the wide variation in states' pension obligations. Much of the variation is tied to the plans' funded ratio condition. In addition, numerous states assume the pension obligations of (and directly pay the employer contributions for) groups of workers outside of direct state employment, most commonly including teachers employed by local school districts. The median unfunded pension burden is 3.6% of personal income, with the lowest unfunded pension obligation alone at 0.0% (for Wisconsin) and the highest obligation at 19.1% (for Illinois).

Net Tax-Supported Debt and Adjusted Pensions as a % of Personal Income



Source: Fitch.

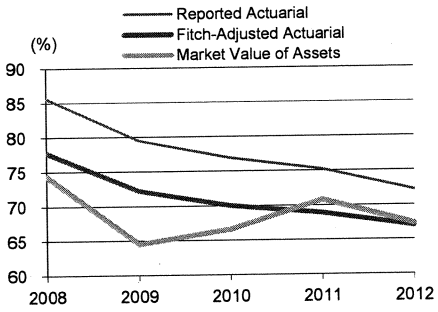
The median burden of net tax-supported debt alone is 2.7% of 2012 personal income, with a low of 0.9% (for Iowa) and a high of 10.0% (for Massachusetts). As with pensions, some states assume responsibility for the debt issuance needs of local entities, notably schools, contributing to the variations in net tax-supported debt.

Pension Systems' Funded Ratios Continue Declining

Pace of Decline Slows

The reported funded ratios for most major statewide pension plans continues to decline, although at a slower pace (see Appendix B), based on the most recently available data (2012 for most plans. Numerous factors are contributing to this decline including past market losses that are continuing to be smoothed into reported funded ratios, the impact of assumption changes (specifically lowering the IRA), and in some cases, the underfunding of annual contributions by states.

Comparative Funded Ratio Trends



Source: Fitch.

Because most pension systems use an asset smoothing mechanism (most commonly five years) to recognize changes in investment values relative to their assumed return, most are still absorbing the deep, recessionary losses of the 2008–2009 recession. Moreover, with uneven investment performance since then, plans' reported funded ratios have continued to decline. Investment performance in 2012 was relatively flat for most plans and well below the IRA assumed in their valuations, adding to downward pressure on actuarial funded ratios. For plans with a June 30 valuation date (the vast majority of plans), 2013 market values are expected to be well over the plans' IRA, providing a material offset to past losses.

Plans' funded ratios using market value of assets in most cases are below reported actuarial funded ratios, suggesting that the overhang of past underperformance yet to be incorporated into reported actuarial funded ratios remains considerable as of the plans' most recent valuation date (see Appendix C). This is particularly true for a handful of plans with anomalously long asset smoothing practices (such as CalPERS — although it also has announced significant actuarial changes since then). Plans with longer smoothing will face additional downward pressure for a longer period in the future. Other statewide plans with no smoothing (such as the statewide plans of Oregon and Idaho) have seen greater funded ratio volatility but have long since absorbed recessionary losses.

Reforms Affecting Some Funded Ratios

More than one-half of the 77 major statewide plans reviewed by Fitch have lowered their IRAs since the downturn (see Appendix D), which has the effect of increasing their liability for future benefits and reducing their reported funded ratios. Despite the negative impact on reported funded ratios, Fitch views a lower IRA as reflecting a more prudent approach to estimating the long-term asset performance of a plan and as evidence of a proactive management stance.

Plans' Investment Return Assumptions by Year
(% by Category)

	2008	2009	2010	2011	2012
8.25 ≥	32.5	29.9	26.0	19.5	11.8
8.00–8.24	33.8	37.7	36.4	32.5	23.7
7.75–7.95	15.6	15.6	18.2	18.2	26.3
7.50–7.74	14.3	14.3	15.6	20.8	30.3
7.00–7.49	3.9	2.6	3.9	7.8	5.3
< 7.00	—	—	—	1.3	2.6

Source: Fitch.

Other reforms have a beneficial effect on funded ratios trends. In a handful of cases, plan sponsors have reduced or eliminated a system's cost-of-living allowance (COLA), which lowers the liability for future benefits and immediately raises the funded ratios, often materially. (For example, the state of Oklahoma eliminated automatic COLAs in 2011.) Benefits for existing workers and retirees are typically considered contractual obligations or are protected by strong statutory or constitutional language, making these reforms difficult and subject to almost certain legal challenge. The vast majority of states have pursued reforms lowering benefits for future hires, which are much easier to enact, although the beneficial impact of such reforms will only manifest itself in pension metrics over decades as the plan's membership profile evolves.

ARC Funding Practices Largely Unchanged

The actuarially calculated ARC and whether governments' actual contribution matched it is an important measure of a state's commitment to extinguishing its unfunded liabilities in a reasonable timeframe. The contribution practices of states vary widely, with some consistently funding a full, actuarially calculated amount due either to longstanding practice or legal requirement. Other states appropriate a specific contribution based on a fixed percentage of payroll, regardless of the actuarially calculated needs of the plan.

In general, the ARC funding for major state plans has declined in recent years, although most states that have

Plans' ARC Funding by Year
(% by Category)

	2008	2009	2010	2011	2012
100 >	52.6	50.0	40.8	38.7	41.3
90–99.9	13.2	6.6	11.8	6.7	12.0
80–89.9	7.9	13.2	14.5	20.0	13.3
70–79.9	5.3	9.2	6.6	10.7	8.0
60–69.9	6.6	7.9	11.8	6.7	8.0
50–59.9	5.3	5.3	3.9	5.3	6.7
< 50	9.2	7.9	10.5	12.0	10.7

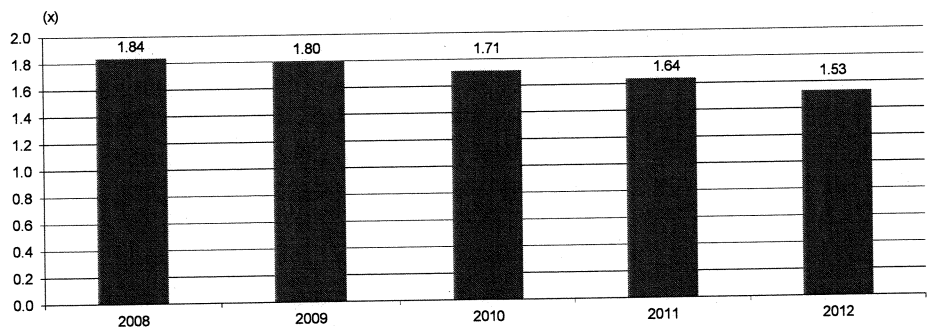
ARC – Annual required contribution.

historically fully funded their annual contributions continue to do so (see Appendix E). For some states, actual contribution levels may differ from the ARC due to the timing of actuarial valuations compared to budget decisions. Some states' past actions to provide multiyear contribution savings, often for budget relief, have accelerated the erosion of their funded ratios (examples include plans in Pennsylvania and New Jersey) and will lead to steep statutory contribution increases as the state reverses past contribution cuts. The plan's funded ratio continues to erode as the sponsoring state statutorily contributes an inadequate amount, often while deferring corrective measures (such as Illinois' plans).

A plan's actuarial assumption for amortizing its unfunded liability is an important factor in assessing state contribution practices. All else being equal, a rolling or lengthy fixed amortization period suggests a weaker commitment to reducing the plan's unfunded liability over time, compared to a declining fixed amortization period. This lengthy amortization period can result in plan funded ratios losing ground despite full ARC funding. Nevertheless, plans remain compliant with existing GASB accounting standards with rolling amortization up to 30 years.

Demographic Pressures, a Longer Term Challenge: The pressure posed by defined benefit pension obligations on state governments is likely to persist in part due to the demographic trends of most plans. By definition, a plan's future pension benefits are intended to be covered over time by its investment returns and the contributions of employees (for most plans) and employers. Given that employee contributions are fixed, the plan sponsor or participating government must shoulder the burden, through employer contributions, of ensuring sufficient resources to cover benefits.

Median Ratio of Actives to Retirees



Source: Fitch.

The growth of actuarially calculated ARCs stemming from investment underperformance is being aggravated by plan demographics. With the aging of the workforce, rising retirements (raising benefit draws) and flat to declining government employment (reducing employee contributions) means that government employers must bear more of the burden of correcting plan funded ratios through their annual contributions. The ratio of plans' active employees to retirees and beneficiaries has continued to decline, with many open plans moving toward having as many retirees as active employees (see Appendix F). Some governments have responded by expanding or implementing employee contributions (including for plans in California, Florida, and Virginia) to offset rising employer contributions.

Appendix A: Estimates of States' Net Tax-Supported Debt and Unfunded Pension Obligations as a Percentage of Personal Income[a]

($ Mil.)

State	Total Net Tax-Supported Debt[b]	Debt as % Personal Income	Rank (Low to High)	Reported Pension UAAL Allocation[c]	Fitch-Adjusted Pension UAAL Allocation[d]	Fitch-Adjusted Pension UAAL as % Personal Income[d]	Rank (Low to High)	Debt and Pension Allocation as % Personal Income	Rank (Low to High)
Alabama	3,575.9	2.1	14	12,200.2	16,227.6	9.4	34	11.5	30
Alaska	893.5	2.6	19	2,926.0	3,752.7	11.0	36	13.6	34
California[e]	91,916.2	5.4	32	46,600.9	56,473.2	3.3	21	8.7	27
Connecticut	18,630.9	8.8	40	24,546.0	31,215.5	14.8	40	23.6	41
Delaware	2,732.6	7.1	38	1,013.9	1,490.1	3.9	22	11.0	29
Florida	21,592.7	2.8	22	3,956.3	6,353.5	0.8	2	3.6	5
Georgia	10,563.7	2.9	24	6,080.9	7,544.9	2.1	13	5.0	14
Hawaii	5,842.6	9.5	41	6,330.7	7,610.5	12.4	37	21.9	40
Idaho	836.1	1.6	7	593.4	806.1	1.5	9	3.0	4
Illinois	33,318.5	5.8	35	94,581.7	109,951.0	19.1	42	24.8	42
Indiana[f]	2,924.3	1.2	4	13,322.2	13,322.2	5.5	24	6.7	20
Iowa	1,080.5	0.8	1	1,354.4	1,721.6	1.3	6	2.2	2
Kentucky	8,989.7	5.9	37	21,355.5	23,891.8	15.6	41	21.4	39
Louisiana	6,195.3	3.4	26	19,305.8	25,068.9	13.8	38	17.2	36
Maine	1,068.2	2.0	13	2,666.1	2,985.3	5.7	26	7.7	24
Maryland	11,252.4	3.7	28	19,868.6	24,336.7	8.0	31	11.6	31
Massachusetts	36,503.6	10.0	42	23,181.2	32,330.7	8.9	33	18.9	37
Michigan	8,022.0	2.2	15	5,988.0	7,832.9	2.1	14	4.3	9
Minnesota	6,555.8	2.6	20	3,090.1	5,339.1	2.1	15	4.8	13
Mississippi	5,243.8	5.3	31	11,005.6	13,885.4	14.1	39	19.4	38
Missouri	4,339.9	1.8	10	4,671.7	6,313.6	2.7	18	4.5	10
Montana	326.2	0.9	2	2,045.4	2,505.9	6.7	27	7.5	23
Nevada	2,047.1	2.0	12	1,933.6	2,665.5	2.6	17	4.6	11
New Hampshire	1,138.6	1.8	9	1,143.6	1,361.0	2.2	16	4.0	8
New Jersey	36,389.9	7.7	39	34,373.9	42,236.6	8.9	32	16.5	35
New York	55,619.0	5.5	33	6,201.2	9,733.8	1.0	4	6.4	19
North Carolina	8,573.1	2.4	16	3,875.9	5,605.1	1.6	10	3.9	6
Ohio	11,391.0	2.5	17	4,540.0	6,418.1	1.4	8	3.9	7
Oklahoma	1,922.7	1.3	5	6,621.5	8,235.9	5.5	25	6.8	21
Oregon	7,750.3	5.1	30	2,451.8	4,174.4	2.8	19	7.9	25
Pennsylvania	15,134.7	2.7	21	35,455.5	40,716.8	7.3	30	10.0	28
Rhode Island	2,335.8	4.9	29	2,915.6	3,296.3	7.0	29	11.9	32
South Carolina	4,126.0	2.5	18	4,385.8	5,132.5	3.2	20	5.7	16
South Dakota	581.8	1.6	8	248.9	423.6	1.2	5	2.8	3
Tennessee	2,189.7	0.9	3	1,554.6	2,285.3	0.9	3	1.8	1
Texas	14,434.5	1.4	6	31,636.5	50,926.9	4.7	23	6.0	18
Utah	3,434.1	3.5	27	1,511.5	1,855.3	1.9	11	5.4	15
Vermont	504.0	1.9	11	1,347.3	1,809.3	6.7	28	8.6	26
Virginia	10,781.8	2.8	23	7,325.7	7,325.7	1.9	12	4.7	12
Washington	18,114.5	5.8	36	3,060.3	4,268.9	1.4	7	7.1	22
West Virginia	1,890.8	3.0	25	5,579.3	6,367.2	10.0	35	12.9	33
Wisconsin	13,283.2	5.7	34	-	-	0.0	1	5.7	17
Median		**2.7**				**3.6**		**7.0**	
Low		**0.8**				**0.0**		**1.8**	
High		**10.0**				**19.1**		**24.8**	

[a]U.S. Bureau of Economic Analysis 2012 personal income by state as of March 27, 2013. [b]Net tax-supported debt based on most recent state bond disclosure documents. [c]Combined pension data by state is estimated by Fitch for all reported state pension plans whose liability is attributable to the state based on state-provided figures, and/or most recent state bond disclosure documents, state annual reports, pension system annual financial reports, and actuarial valuations. [d]Fitch-adjusted figures assume an 11% increase in actuarial liabilities for every 1% variance between 7% and the plan's investment return assumption. [e]Actuarial liability of California State Teachers Retirement System allocated to state is estimated by Fitch based on the share of state statutory contributions to all statutory contributions. [f]Includes the Indiana State Teachers Retirement System pre-1996 plan obligation, which was not intended to be pre-funded and is considered a pay-as-you-go plan.

Appendix B: Reported Plan Information

(As of Actuarial Valuation Dates[a])

Plan Name	Plan Type	Actuarial Valuation Date	2008 Funded Ratio (%)	2009 Funded Ratio (%)	2010 Funded Ratio (%)	2011 Funded Ratio (%)	2012 Funded Ratio (%)	UAAL – Latest Valuation ($ Mil.)
Alabama Employees Retirement System	AME	9/30	75.7	72.2	68.2	65.8	N.A.	4,910.6
Alabama Teachers Retirement System	CSME	9/30	77.6	74.7	71.1	67.5	N.A.	9,346.2
Alaska Public Employees' Retirement System	CSME	6/30	78.8	63.0	62.4	61.9	N.A.	4,156.9
Alaska Teachers' Retirement System	CSME	6/30	70.2	57.0	54.3	54.0	N.A.	2,850.2
California Public Employee Retirement Fund	AME	6/30	86.9	83.3	83.4	82.6	N.A.	57,178.0
California State Teachers' Retirement Fund	CSME	6/30	87.3	78.2	71.5	69.3	67.0	70,957.0
Connecticut State Employees Retirement System	SE	6/30	51.9	N.A.	44.4	47.9	42.3	13,273.8
Connecticut Teachers Retirement System	SE	6/30	70.0	N.A.	61.4	N.A.	55.2	11,127.4
Delaware State Employees	SE	6/30	103.1	98.8	96.0	94.0	91.5	679.4
Florida Retirement System	CSME	7/1	105.3	87.1	86.6	86.9	86.4	20,157.8
Georgia Employees' Retirement System	CSME	6/30	89.4	85.7	80.1	76.0	73.1	4,517.3
Georgia Teachers Retirement System	CSME	6/30	91.9	89.9	85.7	84.0	82.3	12,086.3
Hawaii Employees' Retirement Plan	CSME	6/30	68.8	64.6	61.4	59.4	59.2	8,440.9
Idaho Public Employee Retirement Fund	CSME	7/1	93.3	74.1	78.9	90.2	84.7	2,043.5
Illinois State Employees Retirement System	SE	6/30	46.1	43.5	37.4	35.5	34.7	21,613.9
Illinois State Universities Retirement System	CSME	6/30	58.5	54.3	46.4	44.3	42.1	19,220.3
Illinois Teachers' Retirement System	CSME	6/30	56.0	52.1	48.4	46.5	42.1	52,079.5
Indiana Public Employees Retirement Fund	AME	6/30	97.5	93.1	85.2	80.5	76.6	3,696.0
Indiana State Teachers' Retirement System	CSME	6/30	48.2	41.9	44.3	43.8	42.7	11,945.8
Iowa Public Employees' Retirement System	CSME	6/30	89.1	81.2	81.4	79.9	79.9	5,916.1
Kentucky Employees Retirement System-Non Hazardous	CSME	6/30	52.5	45.0	38.3	33.3	27.3	8,259.7
Kentucky Teachers' Retirement System	CSME	6/30	68.2	63.6	61.0	57.4	54.5	12,282.5
Louisiana State Employees Retirement System	SE	6/30	67.6	60.8	57.7	57.6	55.9	7,131.5
Teachers Retirement System of Louisiana	CSME	6/30	70.2	59.1	54.4	55.1	55.4	10,955.7
Maine Public Employees Retirement System	AME	6/30	79.7	72.6	70.4	80.2	79.1	2,935.2
Maryland Employees Retirement & Pension System	CSME	6/30	77.2	63.9	62.8	62.8	62.5	7,615.4
Maryland Teachers Retirement & Pension System	CSME	6/30	79.6	66.1	65.4	66.3	65.8	11,728.7
Massachusetts State Employees Retirement System	SE	1/1	89.4	71.6	76.5	81.0	73.8	7,277.1
Massachusetts Teachers Retirement System	SE	1/1	73.9	58.2	63.0	66.3	60.7	14,341.6
Michigan Public School Employees' Retirement System	CSME	9/30	83.6	78.9	71.1	64.7	N.A.	22,389.0
Michigan State Employees' Retirement System	SE	9/30	82.8	78.0	72.6	65.5	N.A.	5,385.0
Minnesota General Employees Retirement Fund	CSME	6/30	73.6	70.0	76.4	75.2	73.5	4,937.2
Minnesota State Employees Retirement Fund	CSME	7/1	90.2	85.9	87.3	86.3	82.7	1,920.9
Minnesota Teachers Retirement Fund	CSME	7/1	82.0	77.4	78.5	77.3	73.0	6,219.4
Mississippi Public Employees' Retirement System	CSME	6/30	72.9	67.3	64.2	62.2	58.0	14,500.1
Missouri Dept. of Transportation & Hwy. Patrol Emp. Ret. Sys.	SE	6/30	59.1	47.3	42.2	43.3	46.3	1,775.2
Missouri State Employees' Plan	SE	6/30	85.9	83.0	80.4	79.2	73.2	2,896.5
Montana Public Employees Retirement System	CSME	6/30	90.2	83.5	74.2	70.2	67.4	1,844.4
Montana Teachers Retirement System	CSME	7/1	79.9	66.2	65.4	61.5	59.2	1,962.7
Nevada Public Employees' Retirement System	CSME	6/30	76.2	72.5	70.5	70.2	71.0	11,205.9
New Hampshire Retirement System	CSME	6/30	67.8	58.3	58.5	57.4	56.1	4,543.7
New Jersey Police & Fireman's Retirement System – State & Local	CSME	6/30	74.3	70.8	77.1	74.5	74.3	8,157.5
New Jersey Public Employees' Retirement System – State & Local	CSME	6/30	73.1	64.9	69.5	67.3	63.6	16,506.1
New Jersey Teachers' Pension & Annuity Fund	CSME	7/1	70.8	63.8	67.1	62.8	59.3	21,423.2
New York State & Local Employees' Retirement System	CSME	4/1	107.3	101.0	93.9	90.2	N.A.	13,692.0
New York State & Local Police & Fire Retirement System	CSME	4/1	108.0	103.8	96.7	91.9	N.A.	1,964.0
North Carolina Teachers' & State Employees' Retirement System	CSME	12/31	99.3	95.9	95.4	94.0	N.A.	3,721.7
Ohio Public Employees Retirement System	CSME	12/31	75.3	75.3	79.1	77.4	N.A.	19,051.0
Ohio State Teachers Retirement System	CSME	6/30	79.1	60.0	59.1	58.8	56.0	46,812.3
Oklahoma Public Employees Retirement System	CSME	6/30	73.0	66.8	66.0	80.7	80.2	1,652.4
Oklahoma Teachers' Retirement System	CSME	6/30	50.5	49.8	47.9	56.7	54.8	8,397.5
Oregon Public Employees Retirement System	CSME	12/31	80.2	85.8	86.9	82.0	N.A.	11,030.2

[a]The funded ratios shown are based on the reported actuarial valuation date of each plan rather than the financial statement date. CSME – Cost-sharing multi-employer. AME – Agent multiple employer. SE – Single employer. N.A. – Not available.

Appendix B: Reported Plan Information (continued)

(As of Actuarial Valuation Dates[a])

Plan Name	Plan Type	Actuarial Valuation Date	2008 Funded Ratio (%)	2009 Funded Ratio (%)	2010 Funded Ratio (%)	2011 Funded Ratio (%)	2012 Funded Ratio (%)	UAAL – Latest Valuation ($ Mil.)
Pennsylvania Public School Employees' Retirement System	CSME	6/30	86.0	79.2	75.1	69.1	66.3	29,533.0
Pennsylvania State Employees Retirement System	CSME	12/31	89.0	84.4	75.2	65.3	58.8	17,752.9
Rhode Island Employees Retirement System-State Employees	CSME	6/30	62.3	59.0	59.8	57.4	56.3	1,876.1
Rhode Island Employees Retirement System-Teachers	CSME	6/30	61.0	58.1	61.8	59.7	58.8	2,626.8
South Carolina Police Officers Retirement System	CSME	7/1	77.9	76.3	74.5	72.8	N.A.	1,394.3
South Carolina Retirement System	CSME	7/1	69.3	67.8	65.5	67.4	N.A.	12,406.8
South Dakota Retirement System	CSME	6/30	97.2	91.8	96.3	96.4	92.6	625.0
Tennessee State Emp., Teachers & Higher Ed. Emp. Pension Plan	CSME	7/1	N.A.	90.6	N.A.	92.1	N.A.	2,589.4
Texas Employees Retirement System	SE	8/31	92.6	89.8	85.4	84.5	82.6	5,104.6
Texas Teacher Retirement System	SE	8/31	90.5	83.1	82.9	82.7	81.9	26,101.0
Utah Noncontributory Retirement System	CSME	1/1	86.5	85.7	82.7	79.0	76.1	5,353.3
Utah Public Safety Retirement System	CSME	1/1	81.6	80.6	77.1	75.4	73.0	845.3
Vermont State Retirement System	SE	6/30	94.1	78.9	81.2	79.6	77.7	401.8
Vermont State Teachers' Retirement System	CSME	6/30	80.9	65.4	66.5	63.8	61.6	945.5
Virginia Law Officers' Retirement System	SE	6/30	68.1	64.7	58.6	55.0	N.A.	757.0
Virginia Retirement System	CSME	6/30	84.0	80.2	72.4	69.9	N.A.	22,626.0
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 1	CSME	6/30	128.4	125.4	126.9	134.6	N.A.	(1,430.3)
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 2	CSME	6/30	133.5	127.9	119.0	118.7	N.A.	(1,044.0)
Washington Public Employees Retirement System – Plan 1	CSME	6/30	70.9	69.9	74.1	70.7	N.A.	3,684.0
Washington Public Employees Retirement System – Plan 2/3	CSME	6/30	119.0	116.0	113.0	112.0	N.A.	(2,182.0)
Washington Teachers Retirement System – Plan 1	CSME	6/30	76.8	75.3	84.4	81.1	N.A.	1,773.0
Washington Teachers Retirement System – Plan 2/3	CSME	6/30	125.0	118.0	116.0	113.0	N.A.	(842.0)
West Virginia Public Employees' Retirement System	CSME	6/30	84.2	79.7	74.6	78.4	77.6	1,283.4
West Virginia Teachers' Retirement System	CSME	6/30	50.0	41.3	46.5	53.7	53.0	4,568.2
Wisconsin Retirement System	CSME	12/31	99.7	99.8	99.8	99.9	N.A.	99.3

[a]The funded ratios shown are based on the reported actuarial valuation date of each plan rather than the financial statement date. CSME – Cost-sharing multi-employer. AME – Agent multiple employer. SE – Single employer. N.A. – Not applicable.

Appendix C: Comparative Funded Ratios

(As of Most Recent Actuarial Valuation Date)

Plan Name	Actuarial Valuation Date	Reported Actuarial Funded Ratio (%)	Market Value of Assets Funded Ratio (%)[a]	Actuarial Funded Ratio with 7% Liability Adjustment (%)
Alabama Employees Retirement System	9/30/11	65.8	63.1	59.3
Alabama Teachers Retirement System	9/30/11	67.5	55.3	60.8
Alaska Public Employees' Retirement System	6/30/11	61.9	55.0	55.8
Alaska Teachers' Retirement System	6/30/11	54.0	47.5	48.6
California Public Employee Retirement Fund	6/30/11	82.6	71.2	78.3
California State Teachers' Retirement Fund	6/30/12	67.1	70.0	63.6
Connecticut State Employees Retirement System	6/30/12	42.3	36.8	38.1
Connecticut Teachers Retirement System	6/30/12	55.2	54.2	47.4
Delaware State Employees	6/30/12	91.5	80.8	86.7
Florida Retirement System	7/01/12	86.4	85.7	79.8
Georgia Employees' Retirement System	6/30/12	73.1	69.3	69.3
Georgia Teachers Retirement System	6/30/12	82.3	76.6	78.0
Hawaii Employees' Retirement Plan	6/30/12	59.2	54.9	54.7
Idaho Public Employee Retirement Fund	7/01/12	84.7	85.6	80.3
Illinois State Employees Retirement System	6/30/12	34.7	32.3	32.0
Illinois State Universities Retirement System	6/30/12	42.1	40.1	38.9
Illinois Teachers' Retirement System	6/30/12	42.1	40.9	38.0
Indiana Public Employees Retirement Fund	6/30/12	76.6	76.8	78.7
Indiana State Teachers' Retirement System	6/30/12	42.7	43.2	43.9
Iowa Public Employees' Retirement System	6/30/12	79.9	78.7	75.7
Kentucky Employees Retirement System-Non Hazardous	6/30/12	27.3	25.0	25.2
Kentucky Teachers' Retirement System	6/30/12	54.5	54.5	51.6
Louisiana State Employees Retirement System	6/30/12	55.9	57.6	49.1
Teachers Retirement System of Louisiana	6/30/12	55.4	56.7	48.7
Maine Public Employees Retirement System	6/30/12	79.1	74.2	76.9
Maryland Employees Retirement & Pension System	6/30/12	62.5	59.7	57.7
Maryland Teachers Retirement & Pension System	6/30/12	65.8	63.0	60.7
Massachusetts State Employees Retirement System	1/01/12	73.8	69.3	64.9
Massachusetts Teachers Retirement System	1/01/12	60.7	56.9	53.4
Michigan Public School Employees' Retirement System	9/30/11	64.7	60.3	58.3
Michigan State Employees' Retirement System	9/30/11	65.5	59.9	59.0
Minnesota General Employees Retirement Fund	6/30/12	73.5	72.9	63.1
Minnesota State Employees Retirement Fund	7/01/12	82.7	74.0	71.0
Minnesota Teachers Retirement Fund	7/01/12	73.0	71.0	63.6
Mississippi Public Employees' Retirement System	6/30/12	58.0	55.5	52.2
Missouri Dept. of Transportation & Hwy. Patrol Emp. Ret. Sys.	6/30/12	46.3	46.4	40.7
Missouri State Employees' Plan	6/30/12	73.2	61.8	65.9
Montana Public Employees Retirement System	6/30/12	67.4	68.5	62.3
Montana Teachers Retirement System	7/01/12	59.2	59.7	54.7
Nevada Public Employees' Retirement System	6/30/12	71.0	65.7	63.9
New Hampshire Retirement System	6/30/12	56.1	54.8	51.9
New Jersey Police & Fireman's Retirement System – State & Local	6/30/12	74.3	61.7	67.6
New Jersey Public Employees' Retirement System – State & Local	6/30/12	63.6	52.6	57.9
New Jersey Teachers' Pension & Annuity Fund	7/01/12	59.3	47.9	54.0
New York State & Local Employees' Retirement System	04/01/11	90.2	91.3	85.5
New York State & Local Police & Fire Retirement System	04/01/11	91.9	94.0	87.1
North Carolina Teachers' & State Employees' Retirement System	12/31/11	94.0	89.0	91.5
Ohio Public Employees Retirement System	12/31/11	77.4	76.3	69.7
Ohio State Teachers Retirement System	7/01/12	56.0	54.6	51.7
Oklahoma Public Employees Retirement System	7/01/12	80.2	63.3	76.0
Oklahoma Teachers' Retirement System	6/30/12	54.8	53.4	49.4
Oregon Public Employees Retirement System	12/31/11	82.0	86.0	73.9

[a]Market value excludes securities lending collateral.

Appendix C: Comparative Funded Ratios (continued)

(As of Most Recent Actuarial Valuation Date)

Plan Name	Actuarial Valuation Date	Reported Actuarial Funded Ratio (%)	Market Value of Assets Funded Ratio (%)[a]	Actuarial Funded Ratio with 7% Liability Adjustment (%)
Pennsylvania Public School Employees' Retirement System	6/30/12	66.3	55.1	62.9
Pennsylvania State Employees Retirement System	12/31/12	58.8	55.7	55.7
Rhode Island Employees Retirement System-State Emp. & Teachers	6/30/11	58.8	56.2	54.8
South Carolina Police Officers Retirement System	7/01/11	72.8	59.0	69.0
South Carolina Retirement System	7/01/11	67.4	53.4	63.8
South Dakota Retirement System	6/30/12	92.6	93.1	87.8
Tennessee State Emp., Teachers & Higher Ed. Emp. Pension Plan	7/01/11	92.1	85.6	87.3
Texas Employees Retirement System	8/31/12	82.6	71.9	74.4
Texas Teacher Retirement System	8/31/12	81.9	76.2	73.8
Utah Noncontributory Retirement System	1/01/13	76.1	81.4	72.1
Utah Public Safety Retirement System	1/01/13	73.0	78.1	69.2
Vermont State Retirement System	6/30/12	77.7	76.0	69.3
Vermont State Teachers' Retirement System	6/30/12	61.6	60.2	56.1
Virginia Law Officers' Retirement System	6/30/11	55.0	53.5	55.0
Virginia Retirement System	6/30/11	69.9	67.1	69.9
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 1	6/30/11	134.6	118.8	122.5
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 2	6/30/11	118.7	119.0	112.6
Washington Public Employees Retirement System – Plan 1	6/30/11	70.7	58.8	64.3
Washington Public Employees Retirement System – Plan 2/3	6/30/11	112.0	95.6	88.3
Washington Teachers Retirement System – Plan 1	6/30/11	81.1	67.2	73.8
Washington Teachers Retirement System – Plan 2/3	6/30/11	113.0	98.3	90.3
West Virginia Public Employees' Retirement System	6/30/12	77.6	75.9	73.6
West Virginia Teachers' Retirement System	6/30/12	53.0	56.2	50.2
Wisconsin Retirement System	12/31/11	99.9	N.A.	97.7

[a]Market value excludes securities lending collateral. N.A. – Not applicable.

Appendix D: Investment Return Assumption Changes

(Fiscal Years)

Plan Name	2008 IRA (%)	2012 IRA (%)
Alabama Employees Retirement System	8.00	8.00
Alabama Teachers Retirement System	8.00	8.00
Alaska Public Employees' Retirement System	8.25	8.00
Alaska Teachers' Retirement System	8.25	8.00
California Public Employee Retirement Fund	7.75	7.50
California State Teachers' Retirement Fund	8.00	7.50
Connecticut State Employees Retirement System	8.25	8.00
Connecticut Teachers Retirement System	8.50	8.50
Delaware State Employees	8.00	7.50
Florida Retirement System	7.75	7.75
Georgia Employees' Retirement System	7.50	7.50
Georgia Teachers Retirement System	7.50	7.50
Hawaii Employees' Retirement Plan	8.00	7.75
Idaho Public Employee Retirement Fund	7.75	7.50
Illinois State Employees Retirement System	8.50	7.75
Illinois State Universities Retirement System	8.50	7.75
Illinois Teachers' Retirement System	8.50	8.00
Indiana Public Employees Retirement Fund	7.25	6.75
Indiana State Teachers' Retirement System	7.50	6.75
Iowa Public Employees' Retirement System	7.50	7.50
Kentucky Employees Retirement System-Non Hazardous	7.75	7.75
Kentucky Teachers' Retirement System	7.50	7.50
Louisiana State Employees Retirement System	8.25	8.25
Teachers Retirement System of Louisian[a]	8.25	8.25
Maine Public Employees Retirement System	7.75	7.25
Maryland Employees Retirement & Pension System	7.75	7.75
Maryland Teachers Retirement & Pension System	7.75	7.75
Massachusetts State Employees Retirement System	8.25	8.25
Massachusetts Teachers Retirement System	8.25	8.25
Michigan Public School Employees' Retirement System	8.00	8.00
Michigan State Employees' Retirement System	8.00	8.00
Minnesota General Employees Retirement Fund	8.50	8.50
Minnesota State Employees Retirement Fund[a]	8.50	8.50
Minnesota Teachers Retirement Fund[a]	8.50	8.35
Mississippi Public Employees' Retirement System	8.00	8.00
Missouri Dept. of Transportation & Hwy. Patrol Emp. Ret. Sys.	8.25	8.25
Missouri State Employees' Plan	8.50	8.00
Montana Public Employees Retirement System	8.00	7.75
Montana Teachers Retirement System	7.75	7.75
Nevada Public Employees' Retirement System	8.00	8.00
New Hampshire Retirement System	8.50	7.75
New Jersey Police & Fireman's Retirement System – State & Local	8.25	7.90
New Jersey Public Employees' Retirement System – State & Local	8.25	7.90
New Jersey Teachers' Pension & Annuity Fund	8.25	7.90
New York State & Local Employees' Retirement System	8.00	7.50
New York State & Local Police & Fire Retirement System	8.00	7.50
North Carolina Teachers' & State Employees' Retirement System	7.25	7.25
Ohio Public Employees Retirement System[b]	8.00	8.00
Ohio State Teachers Retirement System	8.00	7.75
Oklahoma Public Employees Retirement System	7.50	7.50
Oklahoma Teachers' Retirement System	8.00	8.00
Oregon Public Employees Retirement System	8.00	8.00
Pennsylvania Public School Employees' Retirement System	8.25	7.50
Pennsylvania State Employees Retirement System	8.50	7.50

[a]System uses multiple rates; in cases without a reported single blended rate, highest rate shown. [b]Most recent data as of 2011.

Appendix D: Investment Return Assumption Changes (continued)

(Fiscal Years)

Plan Name	2008 IRA (%)	2012 IRA (%)
Rhode Island Employees Retirement System-State Employees	8.25	7.50
Rhode Island Employees Retirement System-Teachers	8.25	7.50
South Carolina Police Officers Retirement System	7.25	7.50
South Carolina Retirement System	7.25	7.50
South Dakota Retirement System	7.75	7.50
Tennessee State Emp., Teachers & Higher Ed. Emp. Pension Plan	7.50	7.50
Texas Employees Retirement System	8.00	8.00
Texas Teacher Retirement System	8.00	8.00
Utah Noncontributory Retirement System	7.75	7.50
Utah Public Safety Retirement System	7.75	7.50
Vermont State Retirement System	8.25	8.10
Vermont State Teachers' Retirement System	8.25	7.90
Virginia Law Officers' Retirement System	7.50	7.00
Virginia Retirement System	7.50	7.00
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 1	8.00	7.90
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 2	8.00	7.50
Washington Public Employees Retirement System – Plan 1	8.00	7.90
Washington Public Employees Retirement System – Plan 2/3	8.00	7.90
Washington Teachers Retirement System – Plan 1	8.00	7.90
Washington Teachers Retirement System – Plan 2/3	8.00	7.90
West Virginia Public Employees' Retirement System	7.50	7.50
West Virginia Teachers' Retirement System	7.50	7.50
Wisconsin Retirement System[a b]	7.80	5.50

[a]System uses multiple rates; in cases without a reported single blended rate, highest rate shown. [b]Most recent data as of 2011

Appendix E: Percentage of ARC Funded and Remaining Amortization

Plan Name	2008 % ARC Funded	2012 % ARC Funded	2012 Remaining Amortization Period in Years[a]
Alabama Employees Retirement System	100.0	100.0	30
Alabama Teachers Retirement System	100.0	100.0	30
Alaska Public Employees' Retirement System	77.3	92.7	18
Alaska Teachers' Retirement System	106.0	84.6	18
California Public Employee Retirement Fund	100.0	100.0	25
California State Teachers' Retirement Fund	65.7	45.8	30
Connecticut State Employees Retirement System	99.2	100.0	19
Connecticut Teachers Retirement System	485.7	100.0	22
Delaware State Employees	100.0	100.0	20
Florida Retirement System	107.0	60.0	30
Georgia Employees' Retirement System	100.0	100.0	30
Georgia Teachers Retirement System	100.0	100.0	30
Hawaii Employees' Retirement Plan	95.7	83.7	30
Idaho Public Employee Retirement Fund	108.7	84.5	25
Illinois State Employees Retirement System	59.6	86.2	30
Illinois State Universities Retirement System	48.8	68.3	30
Illinois Teachers' Retirement System	60.0	74.6	30
Indiana Public Employees Retirement Fund	104.3	78.1	30
Indiana State Teachers' Retirement System	101.0	90.9	30
Iowa Public Employees' Retirement System	87.2	98.2	30
Kentucky Employees Retirement System-Non Hazardous	39.5	48.7	25
Kentucky Teachers' Retirement System	83.0	73.5	30
Louisiana State Employees Retirement System	115.4	89.3	30
Teachers Retirement System of Louisiana	116.2	100.0	30
Maine Public Employees Retirement System	100.0	100.1	16
Maryland Employees Retirement & Pension System	75.8	65.9	25
Maryland Teachers Retirement & Pension System	93.6	71.2	25
Massachusetts State Employees Retirement System	124.6	83.7	29
Massachusetts Teachers Retirement System	107.9	90.2	29
Michigan Public School Employees' Retirement System	110.5	83.4	25
Michigan State Employees' Retirement System	115.5	71.1	25
Minnesota General Employees Retirement Fund	81.0	99.1	19
Minnesota State Employees Retirement Fund	58.2	80.7	28
Minnesota Teachers Retirement Fund	82.6	66.4	25
Mississippi Public Employees' Retirement System	97.0	100.0	30
Missouri Dept. of Transportation & Hwy. Patrol Emp. Ret. Sys.	100.0	100.0	20
Missouri State Employees' Plan	100.0	100.0	30
Montana Public Employees Retirement System[c]	106.0	53.7	N.A.
Montana Teachers Retirement System[c]	87.4	81.9	N.A.
Nevada Public Employees' Retirement System	93.0	96.0	20
New Hampshire Retirement System	75.0	100.0	24
New Jersey Police & Fireman's Retirement System – State & Local	81.3	66.8	30
New Jersey Public Employees' Retirement System – State & Local	56.5	51.9	30
New Jersey Teachers' Pension & Annuity Fund	44.8	14.0	30
New York State & Local Employees' Retirement System	100.0	100.0	N.A.
New York State & Local Police & Fire Retirement System	100.0	100.0	N.A.
North Carolina Teachers' & State Employees' Retirement System	99.0	100.0	12
Ohio Public Employees Retirement System[b]	100.0	100.0	30
Ohio State Teachers Retirement System	100.0	41.0	30
Oklahoma Public Employees Retirement System	60.5	109.4	15
Oklahoma Teachers' Retirement System	101.1	115.9	30
Oregon Public Employees Retirement System[b]	74.0	83.0	30
Pennsylvania Public School Employees' Retirement System	40.7	38.1	30
Pennsylvania State Employees Retirement System[a]	39.9	42.8	30

[a]For plans with a range of amortization, longest amortization period shown. [b]ARC funding corresponds to pension fiscal year, not state fiscal year. [c]Excludes reforms subsequent to valuation date [d]Most recent data as of fiscal 2010.

Appendix E: Percentage of ARC Funded and Remaining Amortization (continued)

Plan Name	2008 % ARC Funded	2012 % ARC Funded	2012 Remaining Amortization Period in Years[a]
Rhode Island Employees Retirement System-State Employees	100.0	100.0	24
Rhode Island Employees Retirement System-Teachers	100.0	100.0	24
South Carolina Police Officers Retirement System	100.0	100.0	30
South Carolina Retirement System	100.0	100.0	25
South Dakota Retirement System	100.0	100.0	29
Tennessee State Emp., Teachers & Higher Ed. Emp. Pension Plan	100.0	100.0	9
Texas Employees Retirement System	90.3	49.2	30
Texas Teacher Retirement System	102.0	74.0	30
Utah Noncontributory Retirement System	100.0	100.0	22
Utah Public Safety Retirement System	100.0	100.0	22
Vermont State Retirement System	92.5	140.2	26
Vermont State Teachers' Retirement System	100.5	109.6	26
Virginia Law Officers' Retirement System	91.2	44.3	30
Virginia Retirement System	92.6	59.6	30
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 1	N.A.	N.A.	13
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 2	120.0	83.0	N.A.
Washington Public Employees Retirement System – Plan 1	49.0	51.0	10
Washington Public Employees Retirement System – Plan 2/3	87.7	95.0	N.A.
Washington Teachers Retirement System – Plan 1	38.0	44.0	10
Washington Teachers Retirement System – Plan 2/3	52.4	92.0	N.A.
West Virginia Public Employees' Retirement System	102.1	105.3	23
West Virginia Teachers' Retirement System	110.1	105.3	22
Wisconsin Retirement System[d]	105.0	108.0	19

[a]For plans with a range of amortization, longest amortization period shown. [b]ARC funding corresponds to pension fiscal year, not state fiscal year. [c]Excludes reforms subsequent to valuation date [d]Most recent data as of fiscal 2010. N.A. – Not applicable.

Appendix F: Ratio of Active Members to Retirees and Beneficiaries

Plan Name	2008	2012[a]
Alabama Employees Retirement System	2.42	2.04
Alabama Teachers Retirement System	2.03	1.69
Alaska Public Employees' Retirement System [b]	1.36	0.89
Alaska Teachers' Retirement System [b]	0.94	0.66
California Public Employee Retirement Fund	2.05	1.65
California State Teachers' Retirement Fund	2.11	1.61
Connecticut State Employees Retirement System	1.40	1.09
Connecticut Teachers Retirement System	1.80	1.54
Delaware State Employees	1.72	1.55
Florida Retirement System	2.49	1.87
Georgia Employees' Retirement System	2.13	1.52
Georgia Teachers Retirement System	2.86	2.20
Hawaii Employees' Retirement Plan	1.84	1.61
Idaho Public Employee Retirement Fund	2.16	1.76
Illinois State Employees Retirement System	1.09	1.00
Illinois State Universities Retirement System	1.61	1.30
Illinois Teachers' Retirement System	1.81	1.54
Indiana Public Employees Retirement Fund	2.30	1.99
Indiana State Teachers' Retirement System	1.84	1.41
Iowa Public Employees' Retirement System	1.92	1.61
Kentucky Employees Retirement System – Non Hazardous	1.36	1.16
Kentucky Teachers' Retirement System	1.85	1.65
Louisiana State Employees Retirement System	1.64	1.23
Teachers Retirement System of Louisiana[b]	1.43	1.20
Maine Public Employees Retirement System	1.50	1.31
Maryland Employees Retirement & Pension System	1.62	1.32
Maryland Teachers Retirement & Pension System	1.96	1.63
Massachusetts State Employees Retirement System	1.70	1.58
Massachusetts Teachers Retirement System	1.79	1.51
Michigan Public School Employees' Retirement System[b]	1.67	1.14
Michigan State Employees' Retirement System[b]	0.59	0.32
Minnesota General Employees Retirement Fund	2.25	1.84
Minnesota State Employees Retirement Fund	1.85	1.51
Minnesota Teachers Retirement Fund	1.63	1.38
Mississippi Public Employees' Retirement System	2.25	1.87
Missouri Dept. of Transportation & Hwy. Patrol Emp. Ret. Sys.	1.20	1.10
Missouri State Employees' Plan	1.80	1.38
Montana Public Employees Retirement System	1.70	1.52
Montana Teachers Retirement System	1.55	1.37
Nevada Public Employees' Retirement System	2.78	1.99
New Hampshire Retirement System	2.23	1.96
New Jersey Police & Fireman's Retirement System – State & Local	1.42	1.10
New Jersey Public Employees' Retirement System – State & Local	2.47	1.84
New Jersey Teachers' Pension & Annuity Fund	1.90	1.68
New York State & Local Employees' Retirement System	1.61	1.36
New York State & Local Police & Fire Retirement System	1.13	0.98
North Carolina Teachers' & State Employees' Retirement System	2.32	1.85
Ohio Public Employees Retirement System	2.25	1.83
Ohio State Teachers Retirement System	1.37	1.21
Oklahoma Public Employees Retirement System	1.73	1.41
Oklahoma Teachers' Retirement System	1.96	1.67
Oregon Public Employees Retirement System	1.56	1.42
Pennsylvania Public School Employees' Retirement System	1.57	1.43
Pennsylvania State Employees Retirement System	1.03	0.91

[a]Based on fiscal 2012 financial statement or actuarial valuation data, with exception of Wisconsin Retirement System. Calculation excludes terminated members not yet receiving benefits. [b]Plans closed.

Appendix F: Ratio of Active Members to Retirees and Beneficiaries (continued)

Plan Name	2008	2012[a]
Rhode Island Employees Retirement System State Emp. & Teachers	1.39	1.14
South Carolina Police Officers Retirement System	2.40	1.77
South Carolina Retirement System	1.86	1.52
South Dakota Retirement System	1.95	1.71
Tennessee State Employees, Teachers & Higher Education Employees Pension Plan	1.93	1.63
Texas Employees Retirement System	1.85	1.51
Texas Teacher Retirement System	3.36	2.86
Utah Noncontributory Retirement System	2.95	2.03
Utah Public Safety Retirement System	2.10	1.70
Vermont State Retirement System	1.85	1.41
Vermont State Teachers' Retirement System	1.92	1.39
Virginia Law Officers' Retirement System	5.69	3.28
Virginia Retirement System	2.50	2.09
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 1[b]	0.06	0.03
Washington Law Enf. Officers & Fire Fighters Ret. Sys. – Plan 2	17.42	8.34
Washington Public Employees Retirement System – Plan 1[b]	0.24	0.15
Washington Public Employees Retirement System – Plan 2/3	8.76	5.54
Washington Teachers Retirement System – Plan 1[b]	0.18	0.10
Washington Teachers Retirement System – Plan 2/3	21.65	11.17
West Virginia Public Employees' Retirement System	1.75	1.59
West Virginia Teachers' Retirement System	0.70	1.16
Wisconsin Retirement System[c]	1.84	1.54

[a]Based on fiscal 2012 financial statement or actuarial valuation data, with exception of Wisconsin Retirement System. Calculation excludes terminated members not yet receiving benefits. [b]Plans closed. [c]Most recent data as of 2010.

STANDARD
&POOR'S
RATINGS SERVICES

RatingsDirect®

A Bumpy Road Lies Ahead For U.S. Public Pension Funded Levels

Primary Credit Analyst:
John A Sugden, New York (1) 212-438-1678; john.sugden@standardandpoors.com

Secondary Contacts:
Robin L Prunty, New York (1) 212-438-2081; robin.prunty@standardandpoors.com
Gabriel J Petek, CFA, San Francisco (1) 415-371-5042; gabriel.petek@standardandpoors.com

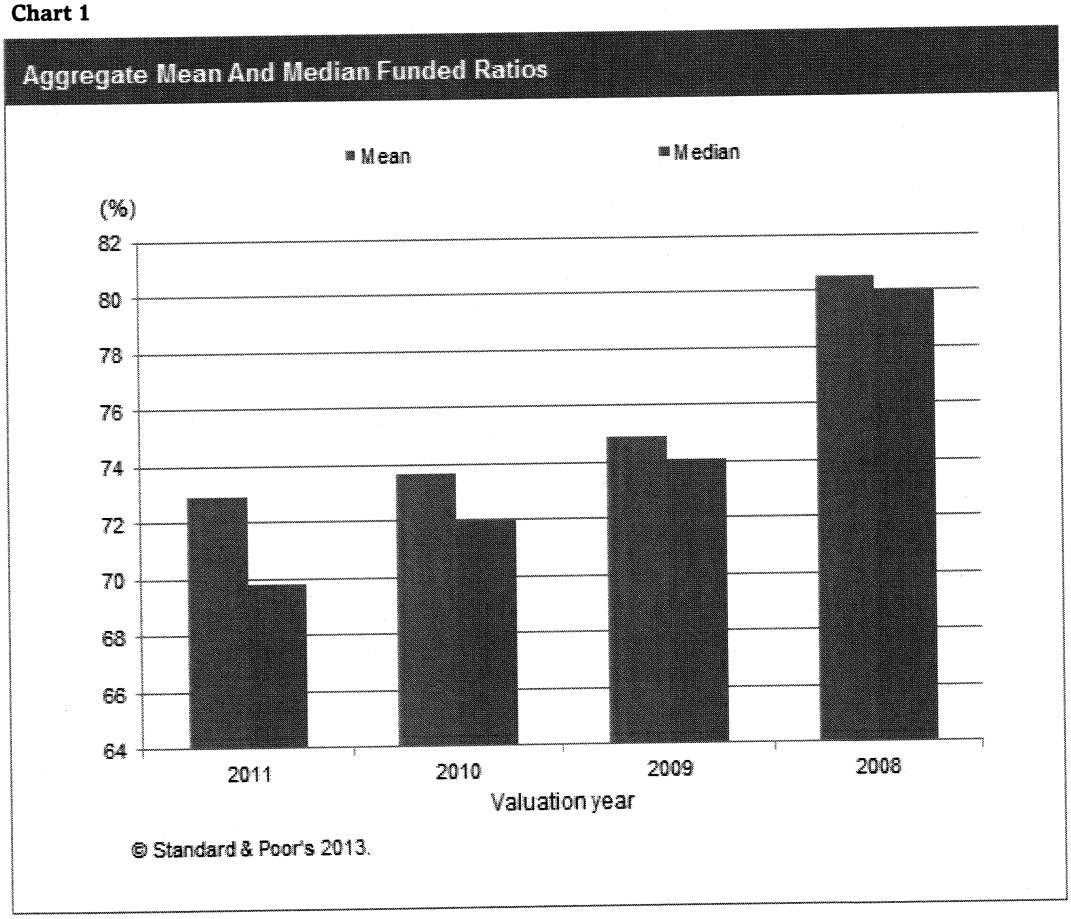
Research Contributors:
Robert Tu, San Francisco (1) 415-371-5087; robert.tu@standardandpoors.com
Akshay S Aggarwal, Mumbai; akshay.aggarwal@standardandpoors.com
Katilyn Pulcher, ASA, CERA, Chicago (1) 312-233-7055; katilyn.pulcher@standardandpoors.com

Table Of Contents

A Bumpy Road Lies Ahead For U.S. Public Pension Funded Levels

U.S. state pensions are showing some signs of stabilization, but significant improvement in funded levels will take many more years, according to Standard & Poor's Ratings Services' 2013 annual survey. The 50-state average funded ratio--or actuarial value of assets divided by the actuarial accrued liabilities--fell by about 1% to 72.9% in 2011 compared with 73.7% in 2010. This is slightly smaller than the 1.6% drop in 2010 and much smaller than the 7% decline from 2008 to 2009. The 50-state median fell by 2.2% to 69.8% from 72%--a similar rate of decline as in 2010 (2.1%) and much lower than the 6% decline in 2009 (see chart 1). This recent trend of smaller declines in the past three years could lead some market watchers to believe that the worst is over and that pension funded levels have bottomed out. Recent equity market performance could also suggest a similar conclusion.

Chart 1



In our view, however, the road to pension funded level improvement will be bumpy. Although a decelerating rate of decline is positive, we expect states will need to actively manage pension funds to ensure their long-term sustainability. Contributing to the ups and downs we expect in pension valuations are market volatility, the implementation of Governmental Accounting Standards Board (GASB) Statements 67 and 68, ongoing pension reform

efforts, and, for those with weaker funded systems, a problematic funding environment as growth in pension contributions consumes a larger part of those states' budgets. We believe this increased level of volatility will require a continued emphasis on pension liabilities management.

Overview

- U.S. state pension funded levels have begun to stabilize but significant improvement will take many more years.
- GASB changes will introduce more volatility but should lead to better comparability and disclosure.
- Continued pension liability management will be key to achieving long-term sustainability.
- States' funding policy decisions and funding discipline will be crucial determinants of pension funded levels.

Managing Pension Funding In A Tight Revenue Setting

States continue to operate cautiously, given uncertain revenues and expenditures. Although revenues for most states have returned to pre-recession levels, they have not kept pace with spending pressures. State officials face increasing budget challenges as they deal with demands to restore service levels, reduce taxes, and implement the provisions of the Affordable Care Act. Establishing a good baseline for fiscal 2014 revenues is difficult due to the uncertainty surrounding sequestration and the potential that fiscal 2013 revenue increases may have been a one-time event -- the result of taxpayers' efforts to take bonuses and capital gains in fiscal 2013 to avoid higher federal tax rates in fiscal 2014. As policymakers adjust to the current post-recession fiscal climate of slow and uncertain economic growth against a backdrop of federal funding uncertainty, the decisions they face are increasingly difficult and pension reform is among their options to rein in long- and short-term spending pressure.

We continue to incorporate governmental liability management--including pensions--into our rating analysis as we have for decades. Given the state sector's generally strong credit profile and the long-term nature of these obligations, we do not view pension liabilities as immediately jeopardizing state governments' capacity to fund their debt service obligations, but we believe they can weaken a state's relative credit profile if left unmanaged. When we've concluded that states are insufficiently managing their pension liabilities, it has detracted from our assessment of overall credit quality. Some states whose pension liabilities management has contributed to lower credit ratings or negative outlooks include Illinois, Kentucky, New Jersey, and Pennsylvania.

Overall, our interpretation of this year's survey results and the credit implications of liabilities for pension systems of the states reflect that:

- Pension funded ratios continue to decline as the investment losses from 2008 and 2009 are smoothed into actuarial value of assets. However, these declines seem to be decelerating.
- Efforts to reform pension systems are far from over and, if anything, are intensifying as more and more policymakers look to make structural changes to their systems that will significantly lower liabilities.
- The implementation of GASB pension reporting and accounting changes, in most cases, will result in the reporting of a greater and more volatile unfunded pension liability.

- States' decisions on what pension funding policy to adopt and their discipline in adhering to the policy are likely to shape the future direction of pension funded levels.
- Most states have sufficient assets in their pension trusts to fund benefits payments over the near to medium term and in many cases, long term. Under the new GASB statements, the crossover point used for discount rate blending will better identify situations when assets will no longer be available to fund benefits. Contributions to fund the state share of pension benefits typically represent a relatively manageable portion of state budgets and, consequently, do not hinder their ability to meet debt service obligations in the near term. However, we will continue to differentiate states' credit profiles with large and growing liabilities, insufficient contributions to effectively amortize the liability, and limited action on reform initiatives.
- Long-term liability management, including pensions, will remain a key component of our analysis.

2013 Pension Survey Results

Standard & Poor's has compiled the latest complete data (see tables 3A-3C), covering valuation data through 2011 for all state-sponsored plans. The data show that the average funded ratio continued to weaken, although only slightly. The data are from 2011 valuations and reported in the states' 2012 comprehensive annual financial reports (CAFRs), the latest year for which CAFRs are available. The wide spread between the highest and lowest funded state plans shows the significant variation among the funded ratios of state plans (see table 1).

In 2011, pension funded ratios dropped for 34 of the 50 U.S. states, remained unchanged for six, and increased for the remaining 10 states. The average funded ratio change for the 50 states was negative 0.8% but changes to individual plans ranged from a 7.3% decline to as much as an 11.6% increase (see table 2). When looking only at the states that had declines, we found that the average drop was 2.5% with a median decline of 2.2%. Of the 13 states that had increased funded levels, the average increase was 3.9% with a median increase of 1.6% and ranged from 0.2% to 11.6% increases in individual funded ratios.

Table 1

Top Five And Bottom Five States By Funded Level

Top five states	**Funded level (%)**
Wisconsin	99.9
South Dakota	96.3
North Carolina	95.3
Washington	93.7
New York	92.7
Bottom five states	**Funded level (%)**
Illinois	43.4
Kentucky	53.4
Connecticut	55.0
Louisiana	56.2
New Hampshire	57.4

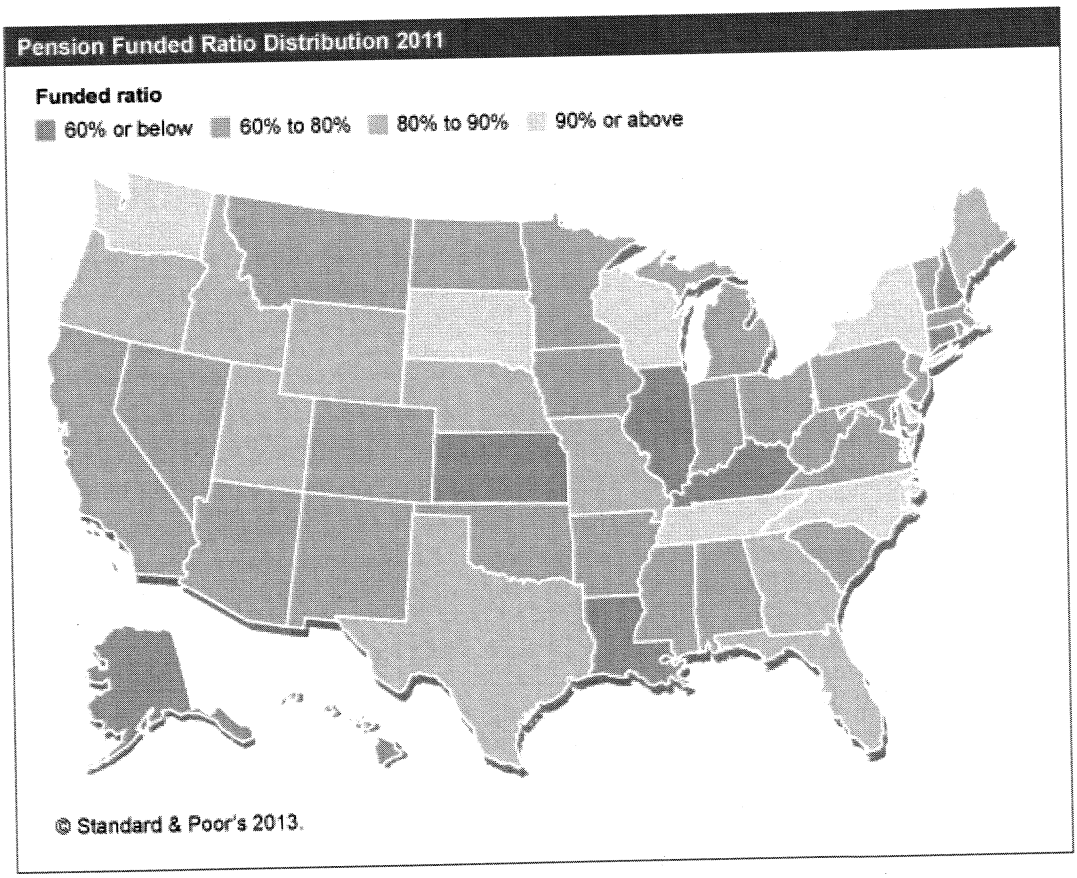
*Does not include Puerto Rico, which is 11.1% funded.

Table 2

Top Five And Bottom Five States By Change In Funded Level

Top five states	**% change**
Idaho	11.6
Oklahoma	10.8
Maine	9.9
West Virginia	6.1
Massachusetts	3.5
Bottom five states	**% change**
Pennsylvania	(7.3)
Michigan	(6.5)
New Mexico	(5.4)
Oregon	(5.0)
Colorado	(4.7)

Pension Funded Ratio Distribution 2011



Changes From GASB Statements 67 And 68

On June 25, 2012, the GASB adopted Statements 67 and 68, related to financial reporting for pension plans and to

financial accounting and reporting for pensions, respectively. The statements do not change the employer's obligations or the employee's benefits, but rather how state and local governments' financial statements calculate, account for, and report pension plan liabilities. Among the major changes are:

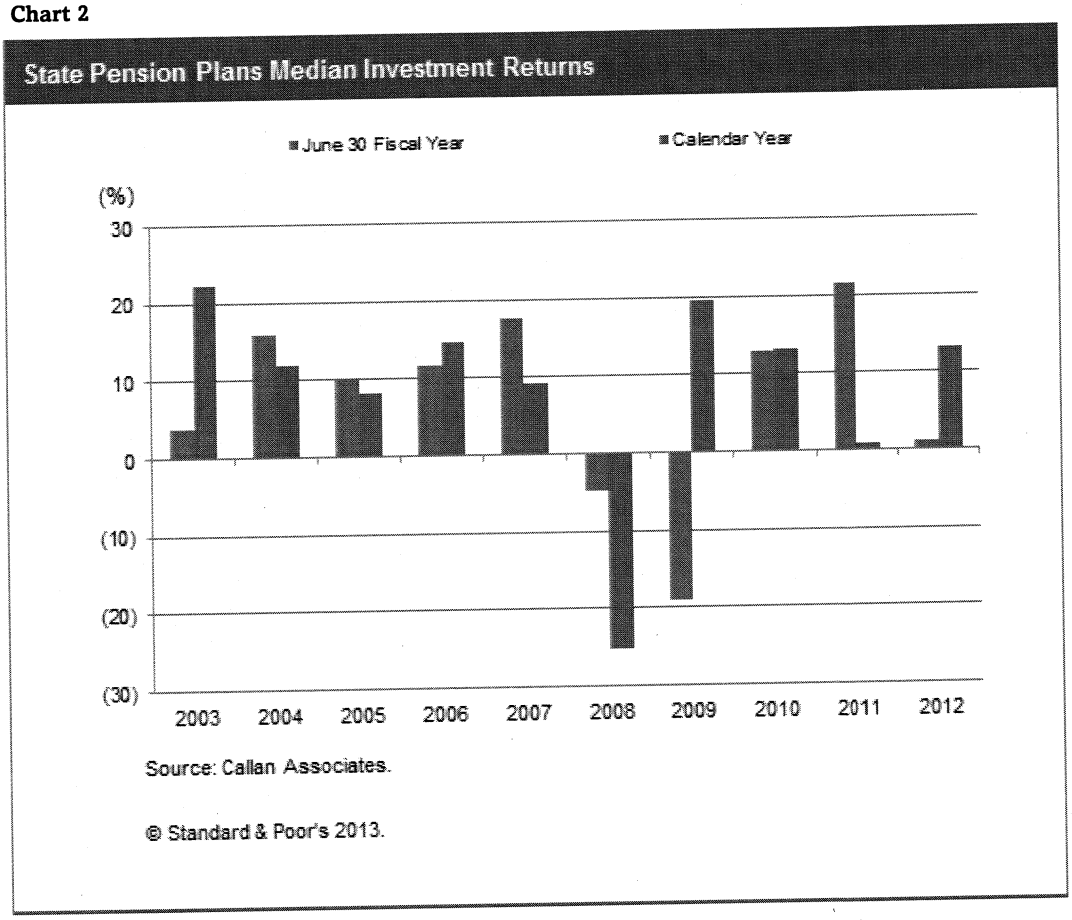
- Use of a blended rate to discount pension plan liabilities;
- Market valuation of assets;
- Elimination of a prescribed annual required contribution (ARC) calculation through the separation of pension funding from pension accounting and reporting;
- Use of one actuarial cost method;
- For multiemployer cost-sharing plans, the proportional reporting of the liability at the employer level; and
- Reporting of net pension liability on employers' balance sheets.

In our view, some of the changes will lead to more conservative liability estimates as well as enhanced comparability and disclosure. However, the use of market valuation of assets is likely to inject a greater degree of volatility into pension liability calculations. Likewise, the separation of pension reporting and accounting from pension funding will create two competing evaluations of the same liability, making the evaluation of pension liabilities more challenging. We believe the loss of a standardized ARC calculation could make pension funding practices more opaque from an analytical perspective and potentially be a setback to a government's funding discipline. (For more information on Standard & Poor's views on GASB changes and their potential impact on state ratings, please see "Credit FAQ: Standard & Poor's Approach to Pension Liabilities In Light Of GASB 67 And 68," published July 16, 2013, on RatingsDirect).

Smoothing Reduces Funding Volatility, For Now

Due to the actuarial smoothing a majority of states employ, current pension valuations have not fully captured the rebound in equity markets that followed the large losses of 2008 and early 2009 (see chart 2). Smoothing methods allow public pension plans to phase in investment gains and losses over several years and moderate the effect of investment market volatility on actuarial valuation of assets and annual pension contributions. About 88% of public pension plans have a smoothing period of four years or longer, with five years being the most common. This smoothing allows governments time to adjust budgets over several years rather than absorb the pension fund gains or losses in one year (see "How "Smoothing" Can Ease The Pain Of Pension Fund Losses For State And Local Governments," Jan. 27, 2009). However, just as there was a lag between the market losses of 2008 and the increased pension contributions, we expect that it will also take time for improved investment performance to reduce the upward pressure on pension contributions. For systems that use five-year smoothing, the impact of the 2008 and 2009 market downturn will be reflected until the 2013 valuations. For fiscal 2014, pension plans will be reporting and accounting net pension liability based on market value of assets under the new GASB statements.

Chart 2



Under the new GASB pension reporting standards, assets will no longer be smoothed for accounting and reporting purposes. Market value of assets will result in much greater volatility in pension funded ratios. These standards will become effective in fiscal 2014 for pension plans and fiscal 2015 for pension reporting at the employer level. The separation of reporting and accounting of pensions from pension funding will create at least two separate sets of assumptions and results.

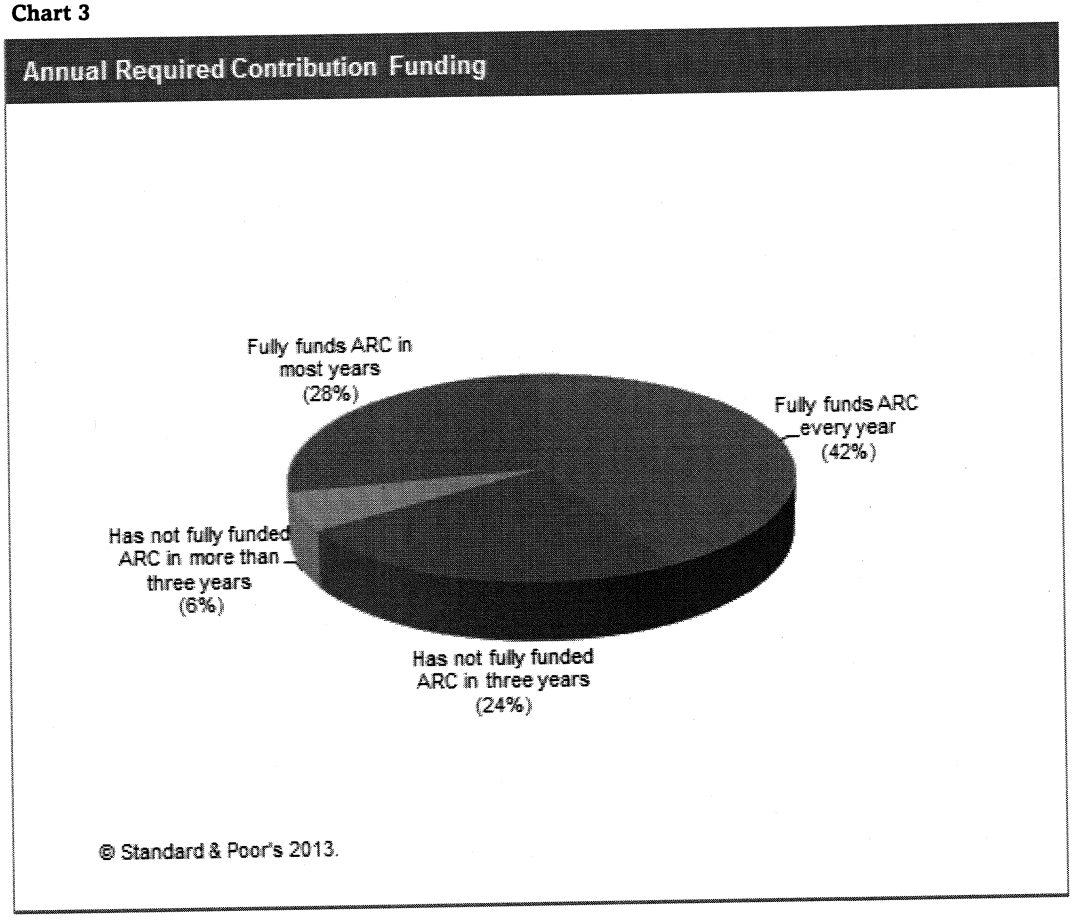
The Dilemma Of Whether To Fund The ARC

The question of how much of their resources to dedicate to funding pension liabilities continues to involve real and frequently difficult tradeoffs. Even as revenues for most states return to pre-recession levels, policymakers must decide between restoring service levels, reducing tax rates, and funding growth in current services. For some states that decided to achieve budgetary relief by underfunding their pensions during the Great Recession or more chronically, a significant portion of the new revenue would be absorbed by restoring higher contributions to their pension systems, making this decision even more difficult. The decision to underfund the ARC might have turned out to be a very costly one.

We evaluate the frequency with which a state fully funds its ARC as part of our review of overall debt and liabilities. Our analysis of pension funding levels suggests that a substantial number of states demonstrated a strong commitment to fully funding their actuarially determined ARCs even throughout the Great Recession (see chart 3). Although about one-quarter of the states might not have contributed their full ARC in some of the most recent years, they had demonstrated a commitment to full ARC funding in at least one of the past three years. And although some states might not be paying their full ARC, they are, nevertheless, typically paying a high percentage of their ARC. We've observed that persistent underfunding of ARC correlates highly with pension funding contributions that are statutorily or contractually determined. Even states whose pension funding contributions are not statutorily or contractually determined may opt for funding less than the ARC as a short-term budgetary management strategy. We believe that not fully funding the ARC is a short-term solution that will likely result in a larger unfunded actuarial accrued liability down the line.

For instance, for Pennsylvania, which has underfunded its ARC over the past eight years, funding the full ARC in fiscal 2014 would require an additional $1.2 billion in funding. This is almost twice the actual growth in spending of $678 million in the 2014 budget, which already includes more than $200 million for pensions. If Pennsylvania were funding its pension ARC, the cost for fiscal 2014 would be $2.6 billion or 9% of the total budget. New Jersey's 2014 budget, to provide another example, increased by $754 million, or 2.3% in fiscal 2014; however, $646 million, or 86% of the total growth in spending, was tied to increases in pension contributions. And current slow revenue growth amplifies even small increases in costs relative to growth in overall spending.

Chart 3



We believe the ARC has become an easily recognizable and understandable measure for governments both large and small. It has provided a certain discipline to pension funding strategies and helped to improve funding levels over time. Under the new GASB standards, plans that have a pension funding policy based on an actuarially determined required contribution will have to report the actuarially determined contribution, while those whose funding is based on statutorily or contractually determined contributions will not have to disclose an actuarially determined contribution. The elimination of the ARC reporting requirement could open the door for weaker funding discipline.

Given the increased attention that pensions have been receiving from taxpayers, government employees, pensioners, regulators, bond market investors, and industry groups, all eyes will be on policymakers as they develop their funding policies and make important decisions on their commitment to funding pensions. Policymakers face an interesting question: Will they use ARC or not to calculate pension funding? Industry groups, including the Big 7 state and local government associations (National Governors Association, the National Conference of State Legislatures, The Council of State Governments, the National Association of Counties, the National League of Cities, The U.S. Conference of Mayors and the International City/County Management Association), the Government Finance and Officers Association, and the Conference of Consulting Actuaries, are developing best practices and guidelines for pension funding. These groups recommend pension funding policies based on actuarially determined contributions. Because

GASB Statement 67 replaces GASB Statement 25, which set out the parameters for calculating the ARC, even those who continue to use the ARC could potentially make some changes to how they calculate their ARC, such as extending the amortization period, which in our view would indicate a weaker funding commitment. From a credit standpoint, a government's funding policy and discipline will continue to be an important element of our pension analysis.

Pension Reform: The New Normal

States, for the most part, have strongly committed to managing their long-term liabilities, including pensions. The unprecedented amount of pension reform efforts in the past few years demonstrates this. Governments and employees alike once considered public employee benefits sacrosanct but are now revisiting them as lawmakers face the difficult trade-off between maintaining current benefits for their retired and active workforce and providing services or tax relief to their taxpayers. While pension reform efforts began to gain steam in 2009, in our view, they have intensified since and have become part of the new normal.

According to the National Conference of State Legislatures (NCSL), between 2009 and 2013, 48 states and Puerto Rico enacted some type of pension reform. Alaska and Idaho, the two states missing from this list, have proposed pension legislation in 2013 and Idaho already enacted its bill. According to NCSL's pension legislation database, all 50 states introduced pension legislation and approximately 1,260 bills so far in 2013; this compares with approximately 980 bills in 44 states in 2012. Of the retirement system bills introduced this year, 35 states, Puerto Rico, and DC have enacted more than 191 with some state legislatures still evaluating some of the proposed bills. Although the actual number of bills introduced is not as important as the measures included in the enacted bills, the number of bills introduced reflects legislators' willingness to address pension issues. Pension reform strategies have varied significantly by state and include:

- Modification of benefit levels for future employees and, in some cases, current employees,
- Increased vesting periods,
- Increased age and service requirements for current and future employees,
- Eliminating or limiting cost of living adjustments (COLAs),
- Increased employee contributions, and
- Closing of defined benefit plans or creation of hybrid defined benefit/defined contribution plans.

In our view, pension reform efforts emphasize sustainability; however, the financial impact on pension liabilities will vary based on the strategy or strategies employed. For the most part, states are considering a range of options as part of a more comprehensive approach to pension reform. To the extent that reform measures, such as increased vesting periods or age and service requirements, apply strictly to future employees, we believe that they could provide opportunity for cost containment over time. However, their impact on current pension liabilities is somewhat limited. Changes to pensions that affect current employees and retirees, such as reductions to or elimination of COLAs and increased employee contributions, are more likely to result in a more immediate reduction of current liabilities and ARC.

According to the NCSL, since 2009, 24 states have adopted current employee pension contribution increases while 11

states have enacted changes to or elimination of COLAs to current employees and retirees, with additional states making changes for at least some active employees or future hires. However, these reform measures also are more likely to be subject to litigation from current employees with the ultimate result not known until all legal venues have been exhausted. Colorado, Florida, Minnesota, and Puerto Rico have had success in court, which may contribute to broader initiatives relating to current employees. However, pension benefit protections vary from state to state, so achieving these changes might be more difficult in some states than others.

Although limited, there has been some shift from defined benefit to defined contribution plans, cash balance, or hybrid plans. These new plans typically offer less generous benefits than the plans they replace, making them more affordable in the long term. However, these changes bring with them some legacy costs and could potentially enlarge the unfunded actuarially accrued liability in the near term, creating an additional hurdle. Nevertheless, we believe that such reforms, despite potentially adding more near-term budgetary costs, can be important components of a government's overall liability management and contribute to greater plan affordability over time.

The Rate Debate Continues

Public pension plans use their assumed long-term rate of return to both discount their liabilities and to determine the amount that will be funded by investment returns versus contributions that employers and employees fund. Investment earnings play an important part in a pension system's overall funding policy. Assumed rates of return have been hotly debated by market participants and observers in recent years due to both the divergence of assumed returns and actual experience over different timeframes and the return volatility of the past few years. The blending of the assumed rate with a high-quality, tax-exempt bond rate of return under the new GASB standards will ensure that this continues to be a topic of frequent and lively discussion in the years to come. Although it is just one of the many assumptions that states use to calculate a pension liability, it is important because it addresses numerous questions regarding a pension system's funding structure:

- How much should a pension plan rely on investment returns versus employer and employee contributions?
- Who should pay if the plan investments do not perform as assumed, the employee or the taxpayers, current employees or future employees?
- What is the right timeframe over which to measure investment performance?
- How much risk should a pension plan take to achieve its assumed rate of return?

In fiscal 2011, investment earnings accounted for 79.5% of total revenue for state-administered pension systems with government and employee contribution making up the balance (see charts 4, 5, and 6). Even when accounting for the losses of 2008 and 2009, investment earnings still contributed more than half of the revenues for public pension plans from fiscal 2007 to fiscal 2011.

Chart 4

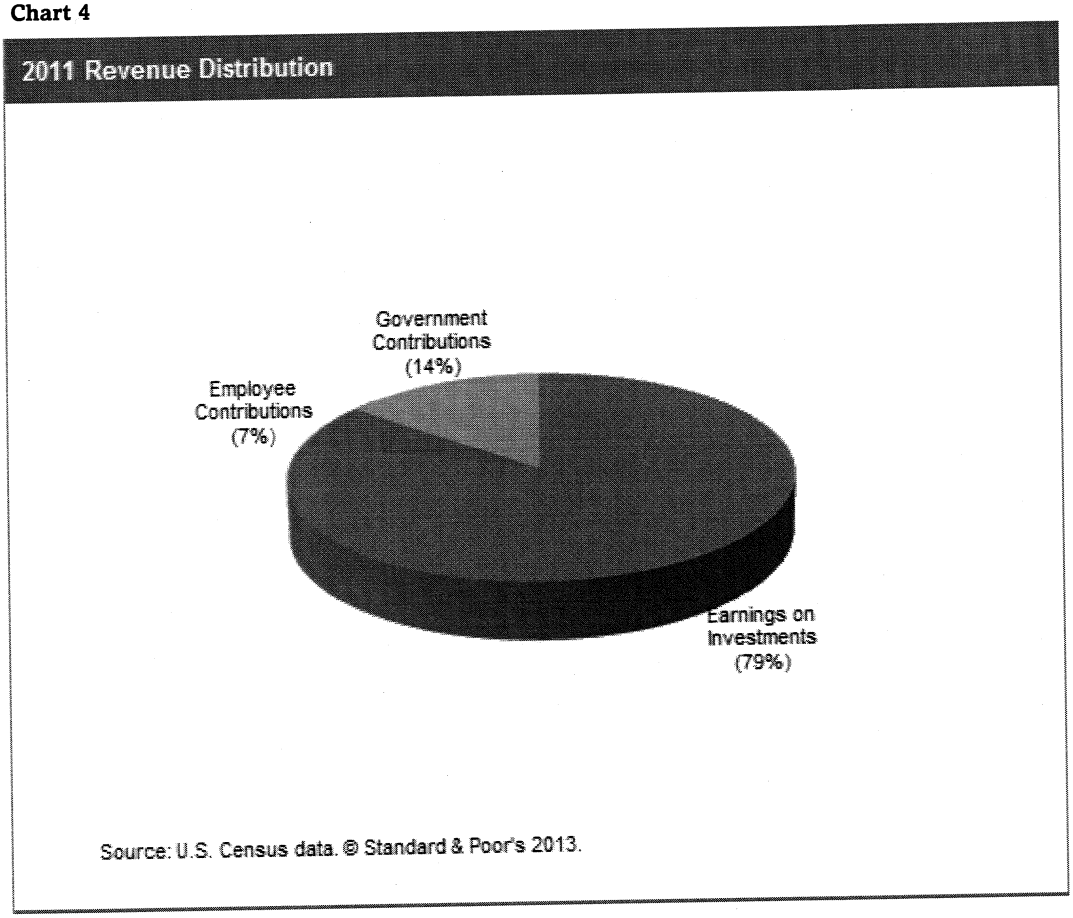
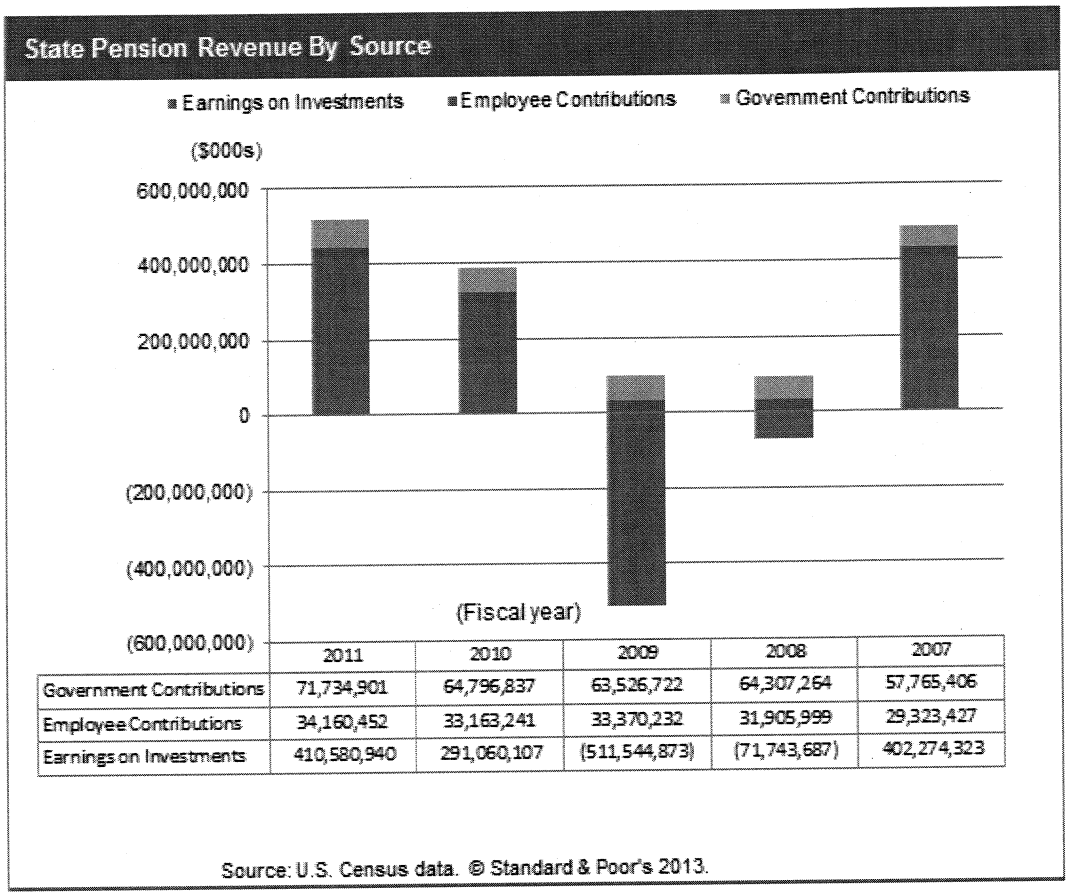

2011 Revenue Distribution
Government Contributions (14%)
Employee Contributions (7%)
Earnings on Investments (79%)
Source: U.S. Census data. © Standard & Poor's 2013.

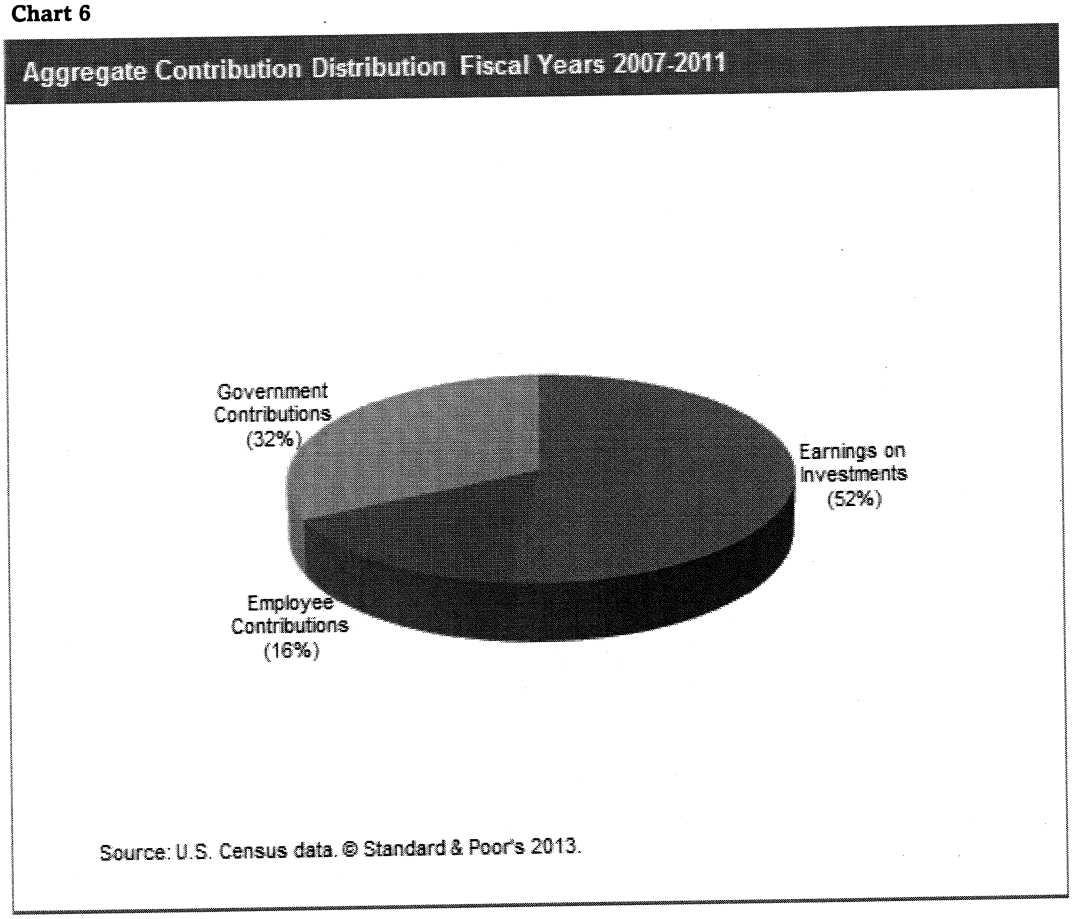
Chart 5



	2011	2010	2009	2008	2007
Government Contributions	71,734,901	64,796,837	63,526,722	64,307,264	57,765,406
Employee Contributions	34,160,452	33,163,241	33,370,232	31,905,999	29,323,427
Earnings on Investments	410,580,940	291,060,107	(511,544,873)	(71,743,687)	402,274,323

Source: U.S. Census data. © Standard & Poor's 2013.

Chart 6



We consider the discount rate in our overall view of a sponsor state's management of its pension liabilities. Relatively high discount rates that reflect rate-of-return assumptions that a plan's historical investment performance or current asset allocation don't support could result in current contribution requirements that are artificially depressed and expose the plan to increased risk to achieve the desired return. Likewise, a risk-free rate of return assumption may not align with a plan's actual and future investment performance and could substantially increase required contribution levels. Overfunded plans in the past have led to pressure from participants or other stakeholders to increase benefit levels.

Given low interest rates and in light of recent market volatility, some policymakers are re-evaluating their rate of return assumptions. Most of the public pension plans in our survey use between a 7.5%-8% rate of return assumption. According to the National Association of State Retirement Administrators, the median public pension annualized investment return for 2012 was 7.5% over 10 years, 7.9% over 20 years, and 8.9% over 25 years, which suggests that long-term investment performance is close to the 7.5%-8% range that most plans assume. However, due to compounding, even if pension systems are meeting their average rate of return target, losses of asset value could still occur.

We expect that any changes to rate of return assumptions will be gradual as plan sponsors try to balance the interest of

all of their stakeholders. However, the disclosure of a relatively higher liability based on GASB standards might encourage policymakers to reconsider their assumed rates of return. To the extent that policymakers revise current rates of return downward, actuarial accrued liabilities and thus, ARCs, will increase. Depending on management's response to these increases, the result could be higher costs to taxpayers, higher contributions from employees, or reduced benefits to employees.

State Pension Funding History: Funded Levels Were Low Previously

Most state governments have a long-term track record of making adjustments and improving funding ratios. Before GASB accounting changes in the 1980s, many public sector pension plans had weak funded ratios and limited asset accumulation by today's standards. According to a Federal Reserve study, in 1975 the aggregate funded ratio of public pensions for states was 51%. However, as Baby Boomers reach retirement age, and given increased longevity, the risks from weaker funded ratios are higher now than they were in the 1970s.

State pension funded ratios made what we consider strong gains in the 1990s, climbing to funded ratios above 100% by 2000, compared with approximately 80% a decade earlier. Above-average investment returns, particularly from equities, contributed to this rapid increase. From 1990 to 2000, the average annual increase of the S&P 500 Index of domestic equities was 15%, compared with an average actuarial return assumption of about 8%. Public pension fund investment allocations to domestic equity rose to about 60% (from 40%) over the same period. This combination of factors, coupled with steadily declining interest rates, helped to produce strong fixed-income returns as well, enabling public funds to exceed their investment return assumptions and achieve the actuarial gains that led to the dramatically improved funded ratios.

During the past decade, however, the funded ratio trend shifted quite rapidly when public pension funds suffered a number of setbacks, including two recessions. In terms of investment yields, the S&P 500 fell 16% in fiscal 2001 and was down 19% in fiscal 2002. Furthermore, the index fell 14.9% in fiscal 2008 followed by a 28.5% decline in fiscal 2009. In addition to these drops in asset values, other factors, such as plan members' increased longevity and the phasing-in of previously granted benefit enhancements for employees, led to rising liabilities. The combination of falling assets and rising liabilities caused average state pension funding levels to fall from their peak in 2000.

Rating Criteria Consider Pension Liabilities

Pension liabilities and the annual costs associated with funding them are important credit factors in our review of state governments. Standard & Poor's views pension obligations as long-term liabilities that must be funded over time. Although the funding schedule can be more flexible than that for a fixed-debt repayment, it can also be more volatile and may cause fiscal stress if not managed, in our opinion. Under our U.S. state ratings criteria (see U.S. State Ratings Methodology, Jan. 3, 2011), a state's debt and liability profile is one of the five major factors that determine a rating. Within this factor, debt, pension liabilities, and other postemployment benefits, which we score individually, are the key metrics. Because pension and retiree health benefits are long-term obligations that must be funded over time, our analysis equally weights the size and management of these liabilities with debt.

Strictly quantitative comparisons are difficult due to the significant variation in how we calculate these liabilities, however. Actuarial treatment of investment returns and governments' smoothing methods also exhibit high variability and can materially affect estimated state pension liabilities. For this reason, we do not evaluate a state's reported unfunded pension and retiree health benefit liabilities plus existing debt in the aggregate when computing debt ratios. Instead, we analyze the state's management of its debt portfolio, pension liabilities, and retiree health benefits liabilities individually before consolidating our view of the state's debt and liability profile. For pensions specifically, we measure a state's pension funded ratio, its track record of fully funding its actuarially required contributions, and unfunded actuarial accrued liability (UAAL) per capita and as a percentage of personal income.

States have varying degrees of responsibility for funding pension plans that they report on in their financial disclosure. For example, in the case of multiemployer agent systems, a state would make contributions to plans that include its employees only, with local agencies contributing to their respective plans. For multiemployer cost-sharing systems, which can include a number of local jurisdictions like school districts with contributions from both employers and employees, the state may be a non-employer contributor. Therefore, with some exceptions, states are generally not directly responsible for fully funding the liabilities of these pension systems. However, even in cases where pensions are direct liabilities of and funded from local agencies, a portion of the local agencies' funding often derives from the states.

Pension Liabilities And State Debt

Our data are mostly as of 2011 valuations as reported in the fiscal 2012 state CAFRs (fiscal year-end 2011 for debt data), which is the most recent year with complete data availability (see tables 3A-3C). We combine the pension data for the state-sponsored, defined-benefit pension funds: generally the public employees' retirement system, including state and local employees in most cases, plus the teachers' retirement system. In some cases, a state may have just one combined system for all employees, while others may have additional systems for specific categories of employees, such as public safety officials, judges, and legislators among others.

In our annual survey, we have reported state debt and unfunded pension liabilities separately and on a combined basis in recent years to give a comparative framework for these liabilities. The pension information includes the systems' funded ratio for each state and the UAAL; the UAAL is also expressed on a per capita basis. We break out tax-supported debt for each state in total as well as on a per capita basis. Pension and debt figures are combined on a per capita basis and then expressed as a percent of per capita income and per capita gross state product as measures of economic resources to meet these obligations.

Highlights of the data include:

- State debt rose to $474 billion in fiscal 2011 from $466 billion in fiscal 2010, a 1.7% increase.
- Unfunded pension liabilities totaled $833 billion as of 2011 and were up from $757 billion, an increase of 10%.
- Average debt per capita increased modestly to $1,334 in fiscal 2012 from $1,322 in fiscal 2011, a 2% increase.
- The average UAAL per capita was $2,902 in 2011 compared with $2,725 in 2010, a 6.5% increase.
- Even with the aggregate decline in funded ratios, seven states remain more than 90% funded, 24 states retain funded ratios of 70% or higher, and 41 states have funded ratios of 60% or higher.

- In relation to the resources available to service these requirements, debt per capita and the per capita unfunded pension liability relative to per capita gross state product had a 50-state average of 9% in 2011, up from 8.8% in 2010.

Table 3A

State Retirement Systems And Debt Statistics: 2011

(Alphabetical)

State	(%)	Increased/Decreased/Unchanged	($)					(%)		
	Funded ratio	Funded ratio relative to prior year	UAAL (mil.)	UAAL PC	Debt (mil.)	Debt PC	Debt PC + UAAL PC	Debt PC + UAAL PC/Income PC	Debt PC+ UAAL PC/GSP PC	GO rating
Alabama	66.9	Decreased	14,415	3,001	3,579	745	3,746	10.7	10.4	AA/Stable
Alaska	59.2	Decreased	7,082	9,799	1,853	2,564	12,363	27.1	17.4	AAA/Stable
Arizona	72.7	Decreased	13,390	2,065	5,663	874	2,939	8.4	7.4	AA-/Stable
Arkansas	72.5	Decreased	6,928	2,358	989	337	2,695	8.0	7.5	AA/Stable
California	77.4	Decreased	124,011	3,290	88,932	2,359	5,650	12.9	10.9	A/Stable
Colorado	60.0	Decreased	22,912	4,478	2,653	518	4,996	11.3	9.7	AA/Stable
Connecticut	55.0	Increased	20,215	5,645	18,371	5,131	10,776	18.6	16.8	AA/Stable
Delaware	90.7	Decreased	787	867	2,175	2,398	3,265	7.9	4.5	AAA/Stable
Florida	86.9	Unchanged	18,956	995	25,250	1,325	2,320	5.9	5.9	AAA/Stable
Georgia	82.5	Decreased	14,684	1,496	9,227	940	2,436	6.8	5.7	AAA/Stable
Hawaii	59.4	Decreased	8,154	5,931	5,427	3,947	9,878	23.0	20.3	AA/Stable
Idaho	89.9	Increased	1,302	822	233	147	969	2.9	2.7	AA+/Stable
Illinois	43.4	Decreased	82,907	6,442	33,633	2,613	9,056	20.7	17.4	A-/Negative
Indiana	63.0	Decreased	14,590	2,239	3,052	468	2,707	7.6	6.3	AAA/Stable
Iowa	79.5	Decreased	5,910	1,930	1,123	367	2,296	5.6	4.7	AAA/Stable
Kansas	59.2	Decreased	9,228	3,214	3,411	1,188	4,402	10.8	9.7	AA+/Stable
Kentucky	53.4	Decreased	23,604	5,402	8,387	1,920	7,322	21.5	19.4	AA-/Negative
Louisiana	56.2	Unchanged	18,512	4,046	5,300	1,158	5,205	13.5	9.6	AA/Stable
Maine	80.2	Increased	2,688	2,024	972	732	2,756	7.2	7.1	AA/Stable
Maryland	63.9	Increased	18,771	3,221	9,577	1,643	4,864	9.6	9.4	AAA/Stable
Massachusetts	71.4	Increased	18,307	2,779	30,803	4,676	7,455	13.9	12.5	AA+/Stable
Michigan	65.1	Decreased	28,358	2,871	6,557	664	3,535	9.7	9.1	AA-/Positive
Minnesota	78.6	Decreased	12,935	2,420	6,338	1,186	3,606	8.1	6.8	AA+/Stable
Mississippi	62.1	Decreased	12,676	4,256	4,845	1,627	5,882	18.4	17.9	AA/Stable
Missouri	81.9	Increased	9,892	1,646	4,689	780	2,426	6.4	5.8	AAA/Stable
Montana	66.3	Decreased	3,861	3,868	174	175	4,042	11.2	10.6	AA/Stable
Nebraska	81.9	Decreased	1,899	1,031	27	15	1,046	2.5	2.0	AAA/Stable
Nevada	70.1	Unchanged	11,038	4,053	2,037	748	4,801	13.0	10.0	AA/Stable
New Hampshire	57.4	Decreased	4,258	3,230	702	532	3,762	8.2	7.8	AA/Stable
New Jersey	67.8	Decreased	41,087	4,658	33,719	3,823	8,480	16.2	15.4	AA-/Negative
New Mexico	67.0	Decreased	10,689	5,133	2,958	1,421	6,554	19.2	17.2	AA+/Stable
New York	92.7	Decreased	18,589	955	50,477	2,593	3,548	6.9	6.0	AA/Positive

Table 3A

State Retirement Systems And Debt Statistics: 2011 (cont.)

North Carolina	95.3	Decreased	3,897	404	7,090	734	1,138	3.2	2.5	AAA/Stable
North Dakota	68.8	Decreased	1,627	2,380	237	346	2,726	5.8	4.6	AA+/Positive
Ohio	67.3	Unchanged	70,423	6,100	10,677	925	7,025	18.6	16.8	AA+/Stable
Oklahoma	66.7	Increased	10,568	2,787	1,707	450	3,237	8.6	7.9	AA+/Stable
Oregon	82.0	Decreased	11,030	2,849	6,823	1,762	4,611	12.3	9.2	AA+/Stable
Pennsylvania	67.8	Decreased	41,163	3,230	13,422	1,053	4,284	10.1	9.4	AA/Negative
Rhode Island	59.2	Decreased	4,369	4,156	1,835	1,746	5,901	13.5	12.4	AA/Stable
South Carolina	67.9	Increased	13,973	2,986	2,344	501	3,487	10.4	9.8	AA+/Stable
South Dakota	96.3	Unchanged	288	350	134	163	513	1.2	1.1	AA+/Stable
Tennessee	91.5	Increased	3,389	529	2,036	318	847	2.3	2.0	AA+/Positive
Texas	82.9	Decreased	28,871	1,124	10,005	390	1,514	3.8	3.0	AA+/Stable
Utah	82.8	Decreased	4,404	1,563	3,442	1,222	2,785	8.3	6.3	AAA/Stable
Vermont	70.4	Decreased	1,192	1,902	492	785	2,688	6.5	6.5	AA+/Positive
Virginia	69.5	Decreased	23,950	2,958	8,720	1,077	4,035	8.8	7.6	AAA/Stable
Washington	93.7	Decreased	4,103	601	16,119	2,360	2,961	6.7	5.7	AA+/Stable
West Virginia	64.2	Increased	5,709	3,077	2,125	1,145	4,223	12.6	11.7	AA/Stable
Wisconsin	99.9	Unchanged	99	17	11,751	2,057	2,075	5.2	4.7	AA/Stable
Wyoming	85.9	Decreased	1,090	1,918	36	63	1,982	4.1	3.0	AAA/Stable
Puerto Rico	11.1	Decreased	32,796	2,574	36,936	9,914	12,487	78.3	72.6	BBB-/Negative
Average of states	72.9		16,656	2,902	9,443	1,334	4,236	10.3	9.0	
Median of states	69.8		10,860	2,818	4,134	997	3,577	8.7	7.9	
Total liability			832,779							

Puerto Rico is not included in the average and median. For Puerto Rico, this calculation includes Employees' Retirement System and Teachers' Retirement System, which for 2010 were 13.5% funded. Changes in funded ratio of less than 0.5% in either direction are shown as unchanged. UAAL--Unfunded accrued actuarial liabilities. PC--Per capita. GSP--Gross state product. Ratings are as of April 2, 2013

Table 3B

State Retirement Systems And Debt Statistics: 2011

(Ranked by Funded Ratio)

State	(%)	Increased/Decreased/Unchanged	($)					(%)		
	Funded ratio	Funded ratio relative to prior year	UAAL (mil.)	UAAL PC	Debt (mil.)	Debt PC	Debt PC + UAAL PC	Debt PC + UAAL PC/Income PC	Debt PC+ UAAL PC/GSP PC	GO rating
Wisconsin	99.9	Unchanged	99	17	11,751	2,057	2,075	5.2	4.7	AA/Stable
South Dakota	96.3	Unchanged	288	350	134	163	513	1.2	1.1	AA+/Stable
North Carolina	95.3	Decreased	3,897	404	7,090	734	1,138	3.2	2.5	AAA/Stable
Washington	93.7	Decreased	4,103	601	16,119	2,360	2,961	6.7	5.7	AA+/Stable
New York	92.7	Decreased	18,589	955	50,477	2,593	3,548	6.9	6.0	AA/Positive
Tennessee	91.5	Increased	3,389	529	2,036	318	847	2.3	2.0	AA+/Positive

Table 3B

State Retirement Systems And Debt Statistics: 2011 (cont.)										
Delaware	90.7	Decreased	787	867	2,175	2,398	3,265	7.9	4.5	AAA/Stable
Idaho	89.9	Increased	1,302	822	233	147	969	2.9	2.7	AA+/Stable
Florida	86.9	Unchanged	18,956	995	25,250	1,325	2,320	5.9	5.9	AAA/Stable
Wyoming	85.9	Decreased	1,090	1,918	36	63	1,982	4.1	3.0	AAA/Stable
Texas	82.9	Decreased	28,871	1,124	10,005	390	1,514	3.8	3.0	AA+/Stable
Utah	82.8	Decreased	4,404	1,563	3,442	1,222	2,785	8.3	6.3	AAA/Stable
Georgia	82.5	Decreased	14,684	1,496	9,227	940	2,436	6.8	5.7	AAA/Stable
Oregon	82.0	Decreased	11,030	2,849	6,823	1,762	4,611	12.3	9.2	AA+/Stable
Missouri	81.9	Increased	9,892	1,646	4,689	780	2,426	6.4	5.8	AAA/Stable
Nebraska	81.9	Decreased	1,899	1,031	27	15	1,046	2.5	2.0	AAA/Stable
Maine	80.2	Increased	2,688	2,024	972	732	2,756	7.2	7.1	AA/Stable
Iowa	79.5	Decreased	5,910	1,930	1,123	367	2,296	5.6	4.7	AAA/Stable
Minnesota	78.6	Decreased	12,935	2,420	6,338	1,186	3,606	8.1	6.8	AA+/Stable
California	77.4	Decreased	124,011	3,290	88,932	2,359	5,650	12.9	10.9	A/Stable
Arizona	72.7	Decreased	13,390	2,065	5,663	874	2,939	8.4	7.4	AA-/Stable
Arkansas	72.5	Decreased	6,928	2,358	989	337	2,695	8.0	7.5	AA/Stable
Massachusetts	71.4	Increased	18,307	2,779	30,803	4,676	7,455	13.9	12.5	AA+/Stable
Vermont	70.4	Decreased	1,192	1,902	492	785	2,688	6.5	6.5	AA+/Positive
Nevada	70.1	Unchanged	11,038	4,053	2,037	748	4,801	13.0	10.0	AA/Stable
Virginia	69.5	Decreased	23,950	2,958	8,720	1,077	4,035	8.8	7.6	AAA/Stable
North Dakota	68.8	Decreased	1,627	2,380	237	346	2,726	5.8	4.6	AA+/Positive
South Carolina	67.9	Increased	13,973	2,986	2,344	501	3,487	10.4	9.8	AA+/Stable
Pennsylvania	67.8	Decreased	41,163	3,230	13,422	1,053	4,284	10.1	9.4	AA/Negative
New Jersey	67.8	Decreased	41,087	4,658	33,719	3,823	8,480	16.2	15.4	AA-/Negative
Ohio	67.3	Unchanged	70,423	6,100	10,677	925	7,025	18.6	16.8	AA+/Stable
New Mexico	67.0	Decreased	10,689	5,133	2,958	1,421	6,554	19.2	17.2	AA+/Stable
Alabama	66.9	Decreased	14,415	3,001	3,579	745	3,746	10.7	10.4	AA/Stable
Oklahoma	66.7	Increased	10,568	2,787	1,707	450	3,237	8.6	7.9	AA+/Stable
Montana	66.3	Decreased	3,861	3,868	174	175	4,042	11.2	10.6	AA/Stable
Michigan	65.1	Decreased	28,358	2,871	6,557	664	3,535	9.7	9.1	AA-/Positive
West Virginia	64.2	Increased	5,709	3,077	2,125	1,145	4,223	12.6	11.7	AA/Stable
Maryland	63.9	Increased	18,771	3,221	9,577	1,643	4,864	9.6	9.4	AAA/Stable
Indiana	63.0	Decreased	14,590	2,239	3,052	468	2,707	7.6	6.3	AAA/Stable
Mississippi	62.1	Decreased	12,676	4,256	4,845	1,627	5,882	18.4	17.9	AA/Stable
Colorado	60.0	Decreased	22,912	4,478	2,653	518	4,996	11.3	9.7	AA/Stable
Hawaii	59.4	Decreased	8,154	5,931	5,427	3,947	9,878	23.0	20.3	AA/Stable
Kansas	59.2	Decreased	9,228	3,214	3,411	1,188	4,402	10.8	9.7	AA+/Stable
Rhode Island	59.2	Decreased	4,369	4,156	1,835	1,746	5,901	13.5	12.4	AA/Stable
Alaska	59.2	Decreased	7,082	9,799	1,853	2,564	12,363	27.1	17.4	AAA/Stable
New Hampshire	57.4	Decreased	4,258	3,230	702	532	3,762	8.2	7.8	AA/Stable
Louisiana	56.2	Unchanged	18,512	4,046	5,300	1,158	5,205	13.5	9.6	AA/Stable

Table 3B

State Retirement Systems And Debt Statistics: 2011 (cont.)

Connecticut	55.0	Increased	20,215	5,645	18,371	5,131	10,776	18.6	16.8	AA/Stable
Kentucky	53.4	Decreased	23,604	5,402	8,387	1,920	7,322	21.5	19.4	AA-/Negative
Illinois	43.4	Decreased	82,907	6,442	33,633	2,613	9,056	20.7	17.4	A-/Negative
Puerto Rico	11.1	Decreased	32,796	2,574	36,936	9,914	12,487	78.3	72.6	BBB-/Negative
Average of states	72.9		16,656	2,902	9,443	1,334	4,236	10.3	9.0	
Median of states	69.8		10,860	2,818	4,134	997	3,577	8.7	7.9	
Total liability			832,779							

Puerto Rico is not included in the average and median. For Puerto Rico, this calculation includes Employees' Retirement System and Teachers' Retirement System, which for 2010 were 13.5% funded. Changes in funded ratio of less than 0.5% in either direction are shown as unchanged. UAAL--Unfunded accrued actuarial liabilities. PC--Per capita. GSP--Gross state product. Ratings are as of April 2, 2013

Table 3C

State Retirement Systems And Debt Statistics: 2011

(Ranked By Per Capita Debt and UAAL)

	(%)	Increased/Decreased/Unchanged	($)					(%)		
State	Funded ratio	Funded ratio relative to prior year	UAAL (mil.)	UAAL PC	Debt (mil.)	Debt PC	Debt PC + UAAL PC	Debt PC + UAAL PC/Income PC	Debt PC+ UAAL PC/GSP PC	GO rating
South Dakota	96.3	Unchanged	288	350	134	163	513	1.2	1.1	AA+/Stable
Tennessee	91.5	Increased	3,389	529	2,036	318	847	2.3	2.0	AA+/Positive
Idaho	89.9	Increased	1,302	822	233	147	969	2.9	2.7	AA+/Stable
Nebraska	81.9	Decreased	1,899	1,031	27	15	1,046	2.5	2.0	AAA/Stable
North Carolina	95.3	Decreased	3,897	404	7,090	734	1,138	3.2	2.5	AAA/Stable
Texas	82.9	Decreased	28,871	1,124	10,005	390	1,514	3.8	3.0	AA+/Stable
Wyoming	85.9	Decreased	1,090	1,918	36	63	1,982	4.1	3.0	AAA/Stable
Wisconsin	99.9	Unchanged	99	17	11,751	2,057	2,075	5.2	4.7	AA/Stable
Iowa	79.5	Decreased	5,910	1,930	1,123	367	2,296	5.6	4.7	AAA/Stable
Florida	86.9	Unchanged	18,956	995	25,250	1,325	2,320	5.9	5.9	AAA/Stable
Missouri	81.9	Increased	9,892	1,646	4,689	780	2,426	6.4	5.8	AAA/Stable
Georgia	82.5	Decreased	14,684	1,496	9,227	940	2,436	6.8	5.7	AAA/Stable
Vermont	70.4	Decreased	1,192	1,902	492	785	2,688	6.5	6.5	AA+/Positive
Arkansas	72.5	Decreased	6,928	2,358	989	337	2,695	8.0	7.5	AA/Stable
Indiana	63.0	Decreased	14,590	2,239	3,052	468	2,707	7.6	6.3	AAA/Stable
North Dakota	68.8	Decreased	1,627	2,380	237	346	2,726	5.8	4.6	AA+/Positive
Maine	80.2	Increased	2,688	2,024	972	732	2,756	7.2	7.1	AA/Stable
Utah	82.8	Decreased	4,404	1,563	3,442	1,222	2,785	8.3	6.3	AAA/Stable
Arizona	72.7	Decreased	13,390	2,065	5,663	874	2,939	8.4	7.4	AA-/Stable
Washington	93.7	Decreased	4,103	601	16,119	2,360	2,961	6.7	5.7	AA+/Stable
Oklahoma	66.7	Increased	10,568	2,787	1,707	450	3,237	8.6	7.9	AA+/Stable
Delaware	90.7	Decreased	787	867	2,175	2,398	3,265	7.9	4.5	AAA/Stable

Table 3C

State Retirement Systems And Debt Statistics: 2011 (cont.)

South Carolina	67.9	Increased	13,973	2,986	2,344	501	3,487	10.4	9.8	AA+/Stable
Michigan	65.1	Decreased	28,358	2,871	6,557	664	3,535	9.7	9.1	AA-/Positive
New York	92.7	Decreased	18,589	955	50,477	2,593	3,548	6.9	6.0	AA/Positive
Minnesota	78.6	Decreased	12,935	2,420	6,338	1,186	3,606	8.1	6.8	AA+/Stable
Alabama	66.9	Decreased	14,415	3,001	3,579	745	3,746	10.7	10.4	AA/Stable
New Hampshire	57.4	Decreased	4,258	3,230	702	532	3,762	8.2	7.8	AA/Stable
Virginia	69.5	Decreased	23,950	2,958	8,720	1,077	4,035	8.8	7.6	AAA/Stable
Montana	66.3	Decreased	3,861	3,868	174	175	4,042	11.2	10.6	AA/Stable
West Virginia	64.2	Increased	5,709	3,077	2,125	1,145	4,223	12.6	11.7	AA/Stable
Pennsylvania	67.8	Decreased	41,163	3,230	13,422	1,053	4,284	10.1	9.4	AA/Negative
Kansas	59.2	Decreased	9,228	3,214	3,411	1,188	4,402	10.8	9.7	AA+/Stable
Oregon	82.0	Decreased	11,030	2,849	6,823	1,762	4,611	12.3	9.2	AA+/Stable
Nevada	70.1	Unchanged	11,038	4,053	2,037	748	4,801	13.0	10.0	AA/Stable
Maryland	63.9	Increased	18,771	3,221	9,577	1,643	4,864	9.6	9.4	AAA/Stable
Colorado	60.0	Decreased	22,912	4,478	2,653	518	4,996	11.3	9.7	AA/Stable
Louisiana	56.2	Unchanged	18,512	4,046	5,300	1,158	5,205	13.5	9.6	AA/Stable
California	77.4	Decreased	124,011	3,290	88,932	2,359	5,650	12.9	10.9	A/Stable
Mississippi	62.1	Decreased	12,676	4,256	4,845	1,627	5,882	18.4	17.9	AA/Stable
Rhode Island	59.2	Decreased	4,369	4,156	1,835	1,746	5,901	13.5	12.4	AA/Stable
New Mexico	67.0	Decreased	10,689	5,133	2,958	1,421	6,554	19.2	17.2	AA+/Stable
Ohio	67.3	Unchanged	70,423	6,100	10,677	925	7,025	18.6	16.8	AA+/Stable
Kentucky	53.4	Decreased	23,604	5,402	8,387	1,920	7,322	21.5	19.4	AA-/Negative
Massachusetts	71.4	Increased	18,307	2,779	30,803	4,676	7,455	13.9	12.5	AA+/Stable
New Jersey	67.8	Decreased	41,087	4,658	33,719	3,823	8,480	16.2	15.4	AA-/Negative
Illinois	43.4	Decreased	82,907	6,442	33,633	2,613	9,056	20.7	17.4	A-/Negative
Hawaii	59.4	Decreased	8,154	5,931	5,427	3,947	9,878	23.0	20.3	AA/Stable
Connecticut	55.0	Increased	20,215	5,645	18,371	5,131	10,776	18.6	16.8	AA/Stable
Alaska	59.2	Decreased	7,082	9,799	1,853	2,564	12,363	27.1	17.4	AAA/Stable
Puerto Rico	11.1	Decreased	32,796	2,574	36,936	9,914	12,487	78.3	72.6	BBB-/Negative
Average of states	72.9		16,656	2,902	9,443	1,334	4,236	10.3	9.0	
Median of states	69.8		10,860	2,818	4,134	997	3,577	8.7	7.9	
Total liability			832,779							

Puerto Rico is not included in the average and median. For Puerto Rico, this calculation includes Employees' Retirement System and Teachers' Retirement System, which for 2010 were 13.5% funded. Changes in funded ratio of less than 0.5% in either direction are shown as unchanged. UAAL--Unfunded accrued actuarial liabilities. PC--Per capita. GSP--Gross state product. Ratings are as of April 2, 2013

Callan

Anchor to Windward or Albatross? Sea Change in Fixed Income

2013 Regional Workshop

June 25, Chicago

June 26, San Francisco

As fixed income fears continue to grow, investors are once again faced with the question: What is the role of fixed income exposure and how should it be structured? Should it dampen volatility, generate returns, or aim for the potentially elusive combination of accomplishing both? Recently, three of Callan's experts weighed in on these and other questions at Callan Investments Institute workshops in Chicago and San Francisco. Our speakers included Brett Cornwell, CFA; Jason Ellement, FSA, CFA; and William Howard, CFA.

Brett Cornwell began the session by noting, "One of the most common questions we get from clients is, 'What should we be doing with our fixed income allocation?' I'm here today to tell you that we don't have all the answers, but there are some things that fixed income investors can—and should—think about." To provide context for the day's discussion, Cornwell reviewed the current market environment and discussed the major issues facing fixed income investors. These include the low-yield environment, the potential for rising rates, the fact that valuations are not cheap, and the uncertain macro environment.

The major issues facing fixed income investors include the low-yield environment, the potential for rising rates, the fact that valuations are not cheap, and the uncertain macro environment.

"The low yield environment makes your portfolio much more sensitive to a change in interest rates," Cornwell noted. "You've got less income and it's very difficult to achieve return targets. We believe rising rates are coming, we're just uncertain of the timing and perhaps the magnitude. Investors need to accept the possibility of negative returns from the fixed income portfolio in this environment. It's become a bit of a game of relative value. Chasing yield has compressed everything across most fixed income sectors, particularly in the core segments of the market, and it's caused some risky behavior."

Fixed Income Alternatives

The discussion then turned to exploring fixed income alternatives that investors may be considering as they navigate today's challenging environment. Callan groups fixed income alternatives into three broad categories: spread, non-traditional solutions, and liquidity premium trade. During the workshop Cornwell discussed specific instruments in these categories, including bank loans and emerging market debt (spread), opportunistic and unconstrained (non-traditional solutions), and private debt, including direct lending and distressed/special situations (liquidity premium trade). He defined and discussed each product type, highlighting current trends and the potential pros and cons of each.

Bank Loans

Bank loans (as defined by the Credit Suisse Leveraged Loan Index) have virtually no duration, but investors get a yield comparable to instruments like high yield, U.S. dollar emerging market debt, and local currency emerging market debt. The result is comparable yield spreads for dramatically less interest rate risk, making them very attractive in this environment. "A bank loan is senior in the capital structure," noted Cornwell. "There are fewer defaults, and in the event of default, investors typically experience a higher recovery rate. This alternative can make sense if you have the risk budget to extend to non-investment grade credit."

Emerging Market Debt

Callan sees three distinct segments that have been carved out of the emerging market debt area. Historically, it was a segment that was dominated by sovereign issuance, particularly sovereign issuance denominated in U.S. dollars. But as local pensions and other institutional investors within these emerging markets have evolved, a blossoming demand for bonds issued in the local currency has developed.

Emerging market corporate debt is the third segment, which has been expanding rather rapidly in terms of issuance. "From a credit perspective," said Cornwell, "if you believe select emerging markets are managing their balance sheets in a prudent manner, it might make sense to pick up a little yield by extending beyond domestic borders. Investors should also be mindful that while there may be an ability to pay, a willingness to pay might be in question. These investments can be compelling, but certainly can increase your portfolio's risk profile."

Opportunistic

The term "opportunistic" encompasses a variety of different strategies, most of which are managed without regard to a benchmark, can take short positions or have long/short trades in their portfolio, and may have net negative duration. Investors need to have a clear sense of priorities and needs within their fixed income portfolio before exploring these strategies, which range across a spectrum. At one end, you might place absolute return, and on the other a more unconstrained approach. "What you're ultimately doing here is putting your faith in a manager to make timely calls and tactical movements," said Cornwell. "The challenge is that most of these opportunistic strategies have very limited track records."

Direct Lending

Direct lending is very similar to bank loans, but it targets smaller companies, perhaps defined as less than $50 million in EBITDA. "Bank loans in the syndicated market, on average, are between $500 million and $700 million," noted Cornwell. "In direct lending, they're much smaller pieces of capital, up to $200 million. In this post-2008 credit environment, the banks that have traditionally provided this funding have pulled back, partially due to banking regulation. They have to keep more reserves for certain types of loans, so they're seeking a less capital-intensive, higher-return investment. This has created a dearth of capital available to these middle-market companies, creating an opportunity for non-traditional lenders that have the ability to originate, underwrite, and service these loans to step in and provide that capital."

Distressed

This fixed income alternative offers a dynamic and cyclical opportunity set. "Here, you're buying cheap assets from companies where something has gone horribly wrong," said Cornwell. "They could be approaching (or in) default or coming out of bankruptcy. With distressed investing, it's all about deal flow and leverage, but also illiquidity." A variety of situations could cause distress for a company, either top-down macro events—like recessionary periods or global banking crises, affecting access to capital—or company-specific events.

The Role of Fixed Income

Jason Ellement led the next portion of the workshop, a discussion of the role of fixed income for the total return investor and how Callan would structure a fixed income portfolio in today's environment. (Income-oriented investors focused on capital preservation/income generation and liability-driven investing were not within the scope of the presentation.) He noted, "When examining the fixed income portfolio, we encourage investors to step back and ask: How can we generate more return? Are we taking too much risk?" Additional return can also be sought in other areas of the portfolio (e.g., equities, real assets).

He continued, "We've been on a 30-year secular decline in rates that appears to be coming to an end. Credit spreads have compressed and there may not be much room for further tightening. In fact, Callan's 10-year forward-looking capital market expectations actually reflect rising yields and inflation." Are rising rates a bad thing? Ellement presented an illustration of potential fixed income returns over one-, three-, and ten-year periods under different yield scenarios. The key takeaway is that fixed income returns are very time dependent. In a rising yield environment, the reinvestment at higher yields can be a significant driver of long-term return. Investors should be mindful of the time horizon when structuring a fixed income portfolio.

He went on to discuss the correlations of various fixed income asset classes to equities, with the S&P 500 used as a proxy. Certain fixed income asset classes—Treasuries, U.S. fixed income (benchmarked to the Barclays Aggregate), short duration (benchmarked to the Barclays Gov/Credit 1-3 Year), and global fixed income—can be expected to have negative or low positive correlations with equities. These asset classes are suitable for the role of low-risk anchor as they can be expected to provide downside protection in a bear market. "In considering the credit-sensitive sectors such as emerging market debt, bank loans, and high yield, we must be mindful that these are positively correlated with equities," continued Ellement. "There's a lot of interest in diversifying and making the bonds work harder by allocating to credit-sensitive sectors, but at the end of the day, are we still going to have a low-risk anchor?"

In considering the credit-sensitive sectors such as emerging market debt, bank loans, and high yield, we must be mindful that these are positively correlated with equities.

In general, investors can expect asset classes to outperform (on a relative basis) in certain economic scenarios. For example, real assets should beat other asset classes if there is rising inflation. Equities and credit-sensitive fixed income should outperform during rising growth and falling inflation. Importantly, only cash, short duration, U.S. fixed income, and Treasuries are expected to offer some protection in a recessionary environment (i.e., falling growth and falling inflation); adding too much credit-sensitive fixed income and equities may leave the portfolio vulnerable to this scenario.

Fixed Income Diversification

A look at Callan's Fixed Income Periodic Table drives home the importance of diversification. No asset class is in the top spot consistently year after year. Less volatile asset classes such as short duration and the Barclays Aggregate have delivered positive returns in most years. Going forward this may no longer be the case, since yields are so low; the amount of income "cushion" to absorb a capital loss may not be sufficient. Despite the increased potential for incurring a negative return in what used to be considered a "safe" investment, the magnitude of the worst-case return for fixed income pales in comparison to a worst-case return for equities and more volatile fixed income asset classes.

Fixed income returns vary widely by country due to different economic and monetary cycles. "The global fixed universe is a very large opportunity set," noted Ellement. "It's not all great opportunities, of course. There are plenty of markets with even greater economic challenges than those in the U.S., and that's why we would strongly encourage active management to navigate this minefield. An expanded opportunity set offers a differentiated source of return and the possibility of mitigating rising U.S. rates due to exposure to different economic regimes, monetary cycles, and exchange rates."

"If we talk about global fixed income, we can't avoid a discussion on currency hedging," Ellement added. "If you look at a global fixed benchmark unhedged versus hedged, they typically deliver about the same return over a very long time frame, and yet the unhedged is bringing a lot of volatility (currency risk) into the portfolio. However, the case for hedging is not straightforward. An active global fixed income manager may derive alpha from currency bets."

Rising rate protection may be sought by diversifying into credit-sensitive sectors, gaining more non-U.S. fixed income exposure, adding bank loans, or shortening duration.

Ellement then turned to fixed income risk factors. While there are many to consider, he focused on the primary risk factors of real rates, inflation, credit, currency, and liquidity, discussing these against a spectrum of fixed income asset classes by presenting a heat map of comparative sensitivities. The heat map is helpful in assessing which risks the portfolio may be under- or over-exposed to; for example, investors may seek rising rate protection by diversifying into credit-sensitive sectors, gaining more non-U.S. fixed income exposure, adding bank loans, or shortening duration. Of course, credit spread exposure may or may not provide protection in a rising rate environment. (In fact, long Treasury rates rose and long credit spreads widened in the weeks leading up to the workshop.)

Five Fixed Income Structure Alternatives

Ellement then discussed five fixed income portfolios spanning a spectrum of risk profiles. They included a low-risk anchor portfolio, a moderate-risk anchor portfolio, a core-satellite structure with a strategic allocation to credit-sensitive sectors, a core-satellite structure with private debt, and a tactical structure including opportunistic managers.

"Callan does not view these as off-the-shelf solutions," Ellement noted. "Our process is much more customized and collaborative. We'll look at the entire portfolio and discuss your investment goals, risk tolerance, and liquidity needs, among other factors. Then we might gravitate to one particular structure and look at modifying it." The portfolios each featured gauges indicating key features on a scale from low to high, such as expected return, exposure to various risks, fees, and expenses.

Some fixed income structure portfolios come with a few important caveats. The low-risk anchor portfolio considers shortening duration in anticipation of rising rates. However, over the long run this could be a very low-yielding portfolio. In addition, the reshaping of the yield curve in a rising rate environment is an important consideration (e.g., curve flattening would mean rates would rise more on the short end than the long end). Alternatively, investors may wish to employ active bond managers to add value through yield curve positioning, sector rotation, and possibly duration management.

The two core-satellite structure alternatives strategically allocate to credit-sensitive sectors to diversify and boost return, migrating away from the "low-risk anchor" fixed income portfolio. The alternative plus private debt is very illiquid. The tactical approach with opportunistic managers has high implementation risk since 80% of the portfolio is actively managed. Specifically, the opportunistic fixed income mandate comes in many different flavors, and it may be very difficult to establish its expected return, associated risk, and potential for mitigating certain risks (e.g., protection in a rising-rate environment). In selecting an opportunistic manager(s), it is crucial to establish risk/return objectives for the fixed income portfolio first, and then search for the opportunistic manager(s) that can assist in meeting those objectives.

After a detailed exploration of all five fixed income structure alternatives, Ellement presented a comparative analysis. The risk/return expectations for all five are based on Callan's 10-year forecast. Importantly, no active management premium or alpha has been quantified and added to the return expectations. Alternatives one and two are only expected to earn 2.2% to 2.6% over the next 10 years. The more aggressive fixed income structures, which significantly increase credit exposure, are expected to gain 3.4% to 3.9% with only a small increase in fixed income portfolio risk. However, in the context of the entire portfolio, the additional credit exposure is positively correlated with equities.

When structuring a fixed income portfolio, investors need to carefully establish the role of fixed income and an acceptable level of risk in the context of the entire portfolio.

Back-testing the fixed income portfolios shows that alternatives one and two outperform alternatives three, four, and five in most bear equity markets (i.e., alternatives one and two fulfill the role of low-risk anchor). Indeed, the correlations with equities are -0.23 and 0.07 for alternatives one and two, respectively. Alternatives three, four, and five are clearly more risky, with less downside protection in a bear equity market and correlations to equities of 0.51, 0.72, and 0.52, respectively. Ellement concluded, "When structuring a fixed income portfolio, investors need to carefully establish the role of fixed income and an acceptable level of risk in the context of the entire portfolio."

For the final portion of the workshop, Bill Howard kicked off a presentation of two case studies based on Callan clients for whom the firm recently conducted fixed income structure valuations.

Bringing Theory to Life: Case Study One

The first client is a nonprofit with a $300 million long-term investment pool similar to a foundation. They are a total return investor with a 65% allocation to public equities, 30% to fixed income, and 5% in TIPS. (Due to the absence of any other real asset exposure, we excluded the 5% in TIPS in this evaluation.) The current fixed income portfolio is 60% core and 40% core plus with two managers, 100% active. They use the Barclays Aggregate as the benchmark and have about $90 million in fixed income assets. The current structure has been in place for six years. "Overall, we think the structure is reasonable and it could be maintained going forward," said Howard. "It's well diversified, it's simple, and it provides good opportunities for active management to add value."

Callan presented this client with three potential alternative fixed income portfolio structures. Option one would reduce risk by moving to 100% core. In this option, a passive core manager replaces the core plus manager with a market-neutral weight to Treasuries, which should protect the portfolio in a flight-to-quality event. Option two features a switch to core-satellite. Core exposure is slightly increased and diversified with an additional manager. The core plus manager is replaced with dedicated allocations to two plus sectors: high yield and non-U.S. In option three, the focus is on global and credit. Core and core plus managers are replaced by two specialized managers. The global sovereign manager diversifies U.S. government exposure with non-U.S. and emerging market debt, and a U.S. investment-grade credit manager enhances yield while avoiding the below-investment-grade market.

"The first alternative is certainly the low risk/low fee option," said Howard. "Alternative two trades opportunistic exposure to the plus sectors for strategic exposure, and alternative three replaces the broad mandates with two specialized mandates—and represents the biggest departure from the current target. Ultimately, the client decided to retain their current structure for now. They weren't compelled to move to one of these alternatives, but they're going to monitor the fixed income landscape closely, and I expect that they'll revisit the matter in the not-too-distant future."

Bringing Theory to Life: Case Study Two

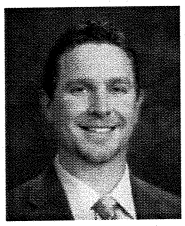
This client is a public fund sponsor with a $550 million pension fund. Their actuarial rate of return is 7.5%. They have a newly approved asset allocation of 54% public equity, 7% private equity, 9% real assets, and 30% fixed income. "After being hired by this client, we conducted an asset/liability study where they approved this newly adopted asset allocation," said Howard. "Next, we reviewed their fixed income structure."

The legacy fixed income structure was a unique core-satellite structure with 60% in core, 40% satellite. The core was all passive and the satellite represented high yield and convertibles. There were four managers, a blend of active/passive, and a blended benchmark, with assets of about $160 million. "We felt this structure of 40% in equity-like investments was very aggressive," noted Howard. "Combined with the fact that they just adopted a new 7% target to private equity, we thought it would be prudent to switch to a new structure."

As with case study one, Callan presented this client with three potential alternative structures for their fixed income portfolio. Option one: reduce risk and simplify. Significant passive core exposure is maintained, providing an anchor to windward in times of stress. TIPS and satellite managers are replaced with a core plus manager that accesses the plus sectors opportunistically. In option two, the client would go heavy on core plus. Passive core exposure is reduced while TIPS and satellite managers are eliminated, and two complementary core plus managers are added. Option three adds an opportunistic element. Reduced passive core exposure is offset with an opportunistic manager that pursues total return in an unconstrained manner; TIPS and satellite managers are replaced with a core plus manager.

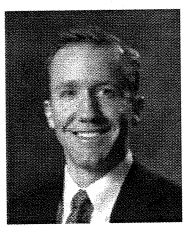
"Alternative one still provides pretty good flight-to-quality protection," said Howard. "It's highly liquid and it's the low-fee alternative. However, it's also the lowest-yielding option, and with 40% passive, there is not as much potential for active management. Alternative two dials up the risk a bit, increases core plus, and reduces the passive core from 40% to 20%, so there's more potential for active management and there should be a higher yield with this structure. Drawbacks include less flight-to-quality protection with only 20% of the portfolio in passive core and higher fees. Alternative three is the most flexible of the three options; it provides the highest potential for active management to add value and it should have the highest yield. The negatives are that it probably offers the least flight-to-quality protection of the three, it has the highest fee, and you have the greatest implementation risk here in terms of hiring the right opportunistic manager."

Ultimately, the client chose the third alternative. They were attracted to having three distinct styles in their portfolio with passive core, core plus, and opportunistic. They also liked the increased flexibility that an opportunistic manager would have in terms of protecting in a rising rate environment and moving to higher-yielding sectors when they were attractively valued.



Brett Cornwell, CFA, is a fixed income investment consultant in Callan's Global Manager Research group. He is responsible for research and analysis of fixed income investment managers and assists plan sponsor clients with fixed income manager searches. Prior to joining Callan in 2010, Brett was a Senior Research Analyst at Wetherby Asset Management. Previous to Wetherby, Brett was a Senior Investment Specialist and Principal at ETRADE Financial in Atlanta, GA. Brett began his career in 1998 at Morgan Stanley Dean Witter. Brett earned a BS in Commerce and Business Administration from the University of Alabama with majors in Finance and Economics. Brett has earned the right to use the Chartered Financial Analyst designation and is a member of CFA Institute and the CFA Society of San Francisco. Additionally, Brett has successfully completed the exams administered by the Financial Industry Regulatory Authority for the series 7, 63, 4, 24, and 31 securities licenses.

Jason Ellement, FSA, CFA, MAAA, is a consultant in the Capital Markets Research group. He is responsible for assisting plan sponsor clients with strategic planning, conducting asset/liability studies, developing optimal investment manager structures, and providing custom research on a variety of investment topics. Jason is a regular instructor at the "Callan College" and a shareholder of the firm. Jason joined Callan in 2002 and has over 18 years of experience in the pensions and investments industry. Prior to joining Callan, Jason practiced as a pension actuary for a prominent public retirement system and an international consulting firm. Jason is a Fellow of the Society of Actuaries and a member of the Academy of Actuaries. He earned the right to use the Chartered Financial Analyst designation and is a member of the CFA Society of San Francisco. Jason graduated with First Class Honors from the University of Manitoba, Canada with a BSc in Actuarial Science & Statistics.



William Howard, CFA, is a consultant in Callan's Denver Fund Sponsor Consulting office. Bill works with a variety of fund sponsor clients, including foundations, public defined benefit plans, and corporate defined contribution plans. His responsibilities include strategic planning, implementation, performance evaluation, and continuing education. Bill is a shareholder of the firm and a member of Callan's Manager Search Committee. Prior to joining Callan in 2001, Bill was a research analyst for Pritchard Investment Management, a registered investment advisor specializing in enhanced index strategies. He began his investment career as a portfolio analyst tracking the performance of investment advisory newsletters at Hulbert Financial Digest. Bill holds an MBA from the University of Denver and a BA from Vanderbilt University. He has earned the right to use the Chartered Financial Analyst designation. Bill is a member of CFA Institute and the CFA Society of Colorado.

Authored by Callan Associates Inc.
If you have any questions or comments, please email institute@callan.com.

About Callan

Callan was founded as an employee-owned investment consulting firm in 1973. Ever since, we have empowered institutional clients with creative, customized investment solutions that are uniquely backed by proprietary research, exclusive data, ongoing education and decision support. Today, Callan advises on more than $1.8 trillion in total assets, which makes us among the largest independently owned investment consulting firms in the U.S. We use a client-focused consulting model to serve public and private pension plan sponsors, endowments, foundations, operating funds, smaller investment consulting firms, investment managers, and financial intermediaries. For more information, please visit www.callan.com.

About the Callan Investments Institute

The Callan Investments Institute, established in 1980, is a source of continuing education for those in the institutional investment community. The Institute conducts conferences and workshops and provides published research, surveys and newsletters. The Institute strives to present the most timely and relevant research and education available so our clients and our associates stay abreast of important trends in the investments industry.

Callan

Corporate Headquarters

Callan Associates
101 California Street
Suite 3500
San Francisco, CA 94111
800.227.3288
415.974.5060

www.callan.com

Regional Offices

Atlanta
800.522.9782

Chicago
800.999.3536

Denver
855.864.3377

New Jersey
800.274.5878