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# Public pensions part 2: Tempest in a teapot, erupting volcano, or something in between?

## Overview

As we continue what may be the longest bull market in history, why have public pension funding levels generally deteriorated? How has the market perception of public pensions changed? In our last Muni Opinion, we gave you a Pension 101 Primer ("Part 1"): you are now an official muni geek, familiar with what a pension plan is, what affects its funded status, and how municipal issuers are impacted by pension liabilities. In this piece, we will explore how and why pension funding has deteriorated during a period of prolonged economic expansion and stock market rally, how this has impacted market perception of municipal credits, and the increasingly important role of active management.

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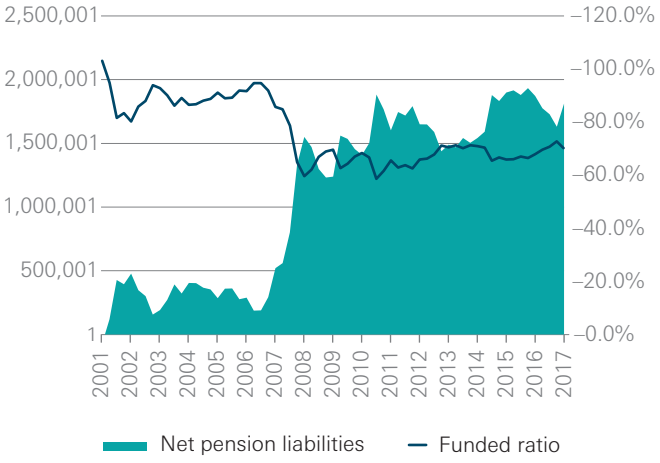
## U.S. public pension plans: where are we today?

Aggregate pension funding levels have deteriorated since 2001; this trajectory was greatly exacerbated by the Great Recession. Today, we estimate that the aggregate unfunded public pension liability equates to anywhere from 31% to 40% of total municipal debt outstanding.

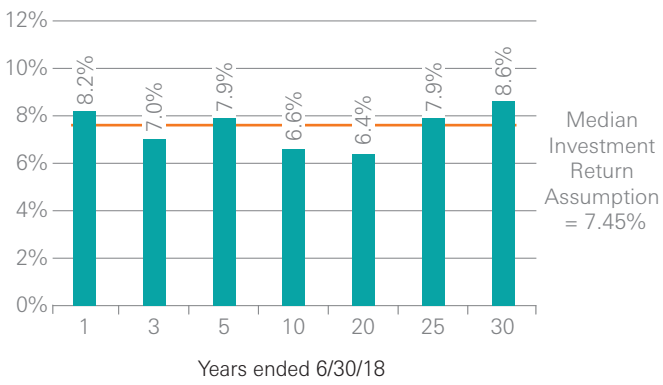
**TABLE 1: WEAKENING OF STATE AND LOCAL PENSION HEALTH SINCE 2001[1]**




See page 6 for source references. May not be indicative of future results.

have generally outpaced their long-term expected rate of return assumptions, but not consistently, and not enough to improve funding levels. From 6/30/2014 through 6/30/2017, in fact, 75% of states saw a contraction in funded status, and other than the District of Columbia, no state improved pension funding by more than 5%[3]. The S&P 500's total return over the three-year period was 31.7%—why have pensions not reaped the full benefit of the raging bull market that investors have experienced this cycle?

**TABLE 2: MISSING THE MARK – OVER THE TRAILING 3,10 AND 20 YEAR PERIODS, PENSION FUND RETURNS HAVE UNDERPERFORMED THEIR MEDIAN EXPECTED RETURN ASSUMPTION[4]**

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What factors have driven this pervasive issue? Recall from Part 1 that a plan's funded status is impacted by several factors including contributions into the fund, investment performance and level of benefits offered. Between 2001 and 2013, the largest drivers of change in unfunded pension liabilities for the plans in the Center for Retirement Research at Boston College database were[2]:
1) Investment returns versus assumptions (60%) and
2) Contribution levels (24%).

Let's investigate the two main drivers at play here:

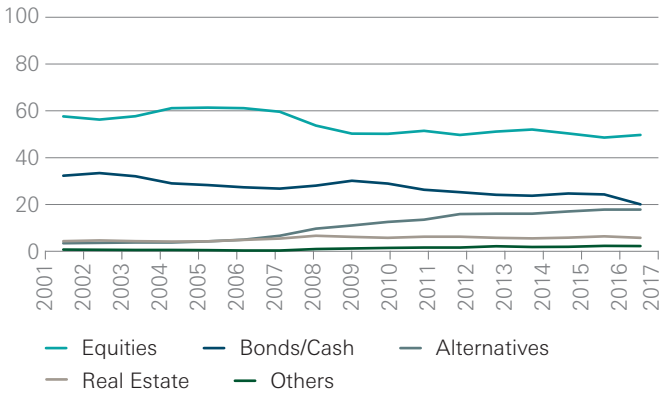
Actual pension asset returns below target investment returns have been, by far, the largest driver of increased pension liabilities. The global financial crisis weighed on the trailing 10 and 20 year average annualized returns as seen in Table 2 (above right) as actual returns underperformed expected returns by 85 basis points (bps) and 105bps, respectively, as of 6/30/2018. Over the trailing 5 years, plans

First, public pension discount rates are generally unrealistically high to begin with, especially now given the significant decline in real returns from many asset classes over the last few decades. In large part, reluctance to lower discount rates is due to the fact that lowering investment return assumptions means higher required contributions, all else equal.

So in the absence of willingness to lower return assumptions, pension managers may feel compelled to reallocate toward riskier assets: a higher amount of risk is now required to achieve the assumed rate of return. Table 3 shows that since 2001, the average public pension plan reduced allocations to equity and fixed income by roughly 10% each, while exposure to alternative investments—such as hedge funds, commodities and private equity—is up 20%. Over the past decade (2008-2017), hedge funds have returned 7.2% and commodities have returned -6.8%, compared to the S&P 500's return of 8.5%[5,6]. In addition to relative

underperformance, certain alternative asset classes such as commodities and private equity tend to exhibit higher volatility and less liquidity than traditional equities and fixed income. Though investment portfolio returns have improved over the past few years, many would challenge whether investment performance can keep up with growing liabilities in the future given current and expected market performance.

**TABLE 3: ASSET ALLOCATION FOR STATE AND LOCAL PENSIONS, 2001-2017[7]**

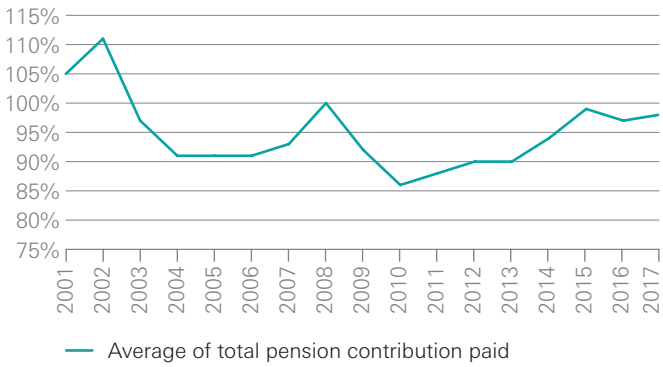



See page 6 for source references. May not be indicative of future results.

The other main factor driving unfunded pension liability growth has been inadequate contributions.

Table 4 shows the average portion of the total required pension contribution that state and local plans contributed between 2001 and 2017. A municipality's contributions may be discretionary versus employee contributions which are typically taken out of payroll. As you can see, municipalities tend to fund pension requirements in a cyclical manner, in line with the broader economy. While we've seen a general contribution uptick since the Great Recession, the average is still below 100%. Several years of underfunding pension contributions have a material impact on unfunded liabilities, since the total funding requirement reflects the amount that is required for a plan to remain solvent over a given time period, assuming the expected return is met, as calculated by actuaries. This then becomes a double-edged sword—municipalities skimp on payments to save cash in one year, driving up the unfunded liability, and in turn, a higher unfunded liability means larger annual contributions are now required in years to come.

**TABLE 4: AVERAGE PENSION CONTRIBUTION PAID AS A PERCENT OF TOTAL REQUIREMENT FOR STATE AND LOCAL PLANS, 2001-2017[8]**




See page 6 for source references. May not be indicative of future results.

Demographic changes also impact pension contribution levels. A low ratio of active employees (currently paying assets into the system) to beneficiaries (retirees and their dependents, utilizing money from the system) creates cash pressure on a system and can have a substantial negative impact on funding health. That ratio has declined from 2.4x in 2001 to 1.4x in 2016 for the nation's largest public pension systems[9]. This is due to:

1) An increased senior population: the nation's age 65+ population is projected to nearly double from 2012 levels to an estimated 83.7 million people by 2050[10].
2) A shrinking government labor force, which is partially attributable to scaled back hiring practices and early retirement incentives implemented following the Great Recession[11].

Bottom line: this means that there are fewer active members of pension plans paying into the system while payouts to retired beneficiaries continue to increase, further pushing up the unfunded liability and therefore contribution requirements.

## Market reaction

While the magnitude of pension liabilities has intensified, a concurrent shift in perspectives of various stakeholders has occurred—heightened investor attention, revised rating agency criteria and related downgrades, and implementation

of new accounting standards which have brought the breadth of the problem onto the balance sheet. Issuer borrowing costs have been impacted as investors demand more yield from bonds of municipalities with large unfunded liabilities.

Since 2014, 15 states have been downgraded by at least one rating agency[12]. Table 6 lists some pension data for these states. It is important to note that downgrades can reflect a number of scenarios, and also that pension issues may occur in conjunction with other fiscal issues. Underfunded pensions can accompany poor budgetary performance, political discord, or a combination of factors directly and indirectly related to pensions. As such, it is likely inconclusive to link rating changes directly to pensions. Still, the observed relationship in Table 5 is worth noting. Nearly all (87%) of the downgraded states have funded ratios below 80%, and 40% of the states have funded ratios under 60%. Additionally, only 13% of the states exhibited improved pension funding levels over the period, with the vast majority experiencing a decline (67%).

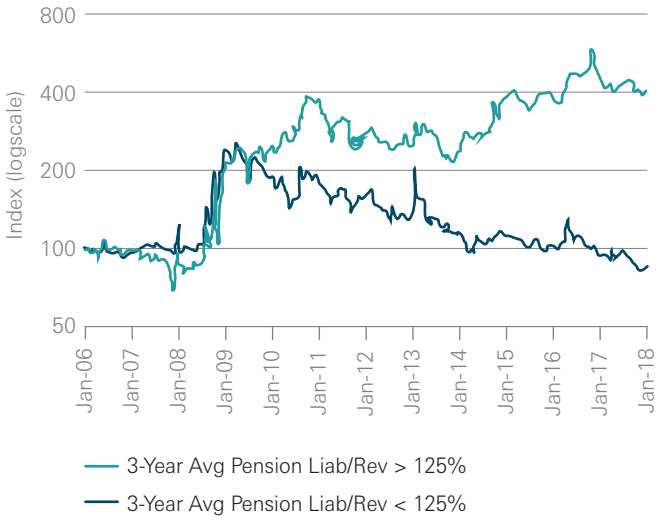
**TABLE 5: STATE DOWNGRADES VERSUS PENSION CHANGES SINCE 2014[13]**

| State | Funded ratio, 2017 | Change in funded ratio, 2014-2017 |
|---|---|---|
| Alaska | 62.7% | + |
| Connecticut | 45.7% | — |
| Illinois | 38.4% | — |
| Kansas | 67.1% | flat |
| Kentucky | 35.2% | — |
| Louisiana | 58.9% | flat |
| Massachusetts | 57.4% | — |
| Mississippi | 62.0% | — |
| New Jersey | 21.0% | — |
| New Mexico | 73.4% | — |
| North Dakota | 65.5% | — |
| Oklahoma | 84.3% | — |
| Pennsylvania | 62.8% | + |
| West Virginia | 93.6% | flat |
| Wyoming | 74.5% | — |

See page 6 for source references. May not be indicative of future results.
Note: "Flat" denotes a change of less than 1%, plus or minus. Average state fiscal year 2017 funded ratio is 70.7%; average of listed states is 60.2%.

In addition to rating action, we can also find interesting correlations between pension issues and credit spreads. Table 6 shows credit spread movement of state general obligation (GO) bonds with manageable pension burdens (relative to their revenue base) in blue, versus that of states with higher pension burdens in green. We see divergence in spreads of credits with manageable versus elevated pension liabilities beginning in 2010 following the global financial crisis. This divergence has since compounded.

**TABLE 6: INDEX OF STATE 10-YEAR GENERAL OBLIGATION SPREADS TO MMD[14,15]**




See page 6 for source references. May not be indicative of future results.
Note: Index includes states with net tax-supported debt > $1 billion in fiscal year 2016.

Since 2010, the GO bond index has underperformed the revenue bond index by 8% on a cumulative basis[16]. This may partially be attributable to a preference for revenue bonds over GO bonds. Many revenue bonds are secured by specific revenue streams that are often not as susceptible to pension pressures as GO bonds. Not only does this help insulate issuers from potential expenditure pressures, it also can be supportive of a more favorable overall liability profile. As we mentioned in Part 1, pensioners fared better than bondholders in several post-recession bankruptcy proceedings, tainting public perception of the GO pledge as sacrosanct. Following these outcomes, investors today have an increased sensitivity to pensions.

Revisions of ratings criteria in recent years also illustrate a heightened focus on pension liabilities. For example, in 2013 Moody's revised its methodology for U.S. states and territories to reflect certain risks that had arisen as a result of the 2008 financial crisis, including growth in unfunded pension liabilities. As a result, its scorecard weighting for pension related criteria increased. Additionally, as discussed in Part 1, the Governmental Accounting Standards Board (GASB) accounting standards now view pension liabilities as debt-like instruments, requiring municipalities and pension plans to report the net pension liability (NPL) (or net pension asset, if overfunded) on their balance sheets. The implementation of these changes also importantly increases transparency for credit analysts. Of particular interest to analysts is that GASB accounting standards now require municipal issuers to report the sensitivity of a NPL to changes in the discount rate, which as we have discussed is a primary driver in measuring a liability. Governmental entities now must show how the magnitude of the NPL changes when the discount rate increases and decreases by 1%. For many plans a 1% reduction in the discount rate can result in an up to 13% increase in plan liabilities[17]. Having these comparisons readily available can better inform our understanding of future pension liability trajectories based on perceived future market performance.

## Looking forward: Where will pension levels go, and how will that impact stakeholders?

We do not expect a marked improvement in public pension funding in the intermediate term. From an investment standpoint, the general lack of progress during the post-recession bull market raises concerns about what will happen in future bear market years. While our DWS CIO View does not predict an economic recession on the horizon, an eventual market downturn is inevitable. As we noted, pension plans face a shift toward riskier assets as a higher amount of risk is now required to achieve their assumed rates of return. Asset allocation has shifted somewhat away from equity and fixed income and towards alternative investments. That said, Callan's capital market assumptions (see Appendix) expect equities to outperform most alternative asset classes over the next ten years, with a better risk-adjusted return profile. Even general fixed income returns are expected by Callan to outperform commodities over the next ten years. However, regardless of asset allocation decisions, in our view, consistently meeting or exceeding the expected rates of return for pension plans will prove to be difficult going forward. Moreover, we generally do not expect municipalities to improve contribution levels more than they already have the since the Great Recession. As we saw in Table 4, during the last recession, municipalities began scaling back the amount they were contributing to their pensions. Even during the expansionary period, during which time governments grew rainy day funds and expanded other services, pension contributions did not recover to 100% of actuarially sound amounts, and municipalities have not been over contributing to their pension funds. For these reasons, we anticipate that pensions will remain an important market topic.

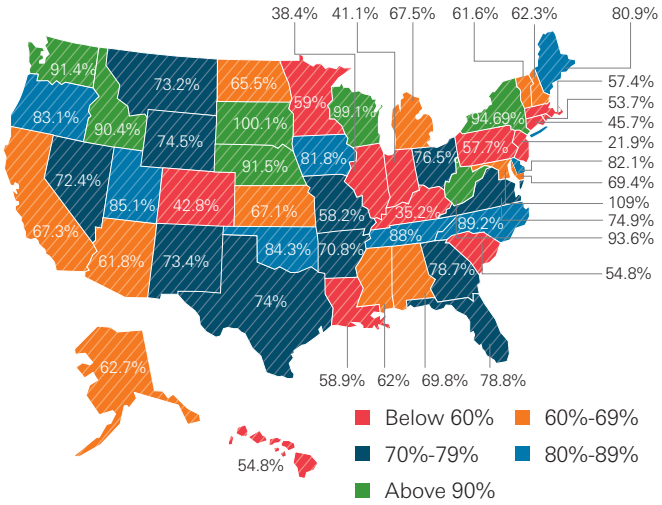
So, is the U.S. public pension problem a tempest in a teapot, an erupting volcano, or something in between?

We have more than bubbling water, but not quite molten lava; active management can help mitigate the in-between. How will this impact stakeholders? First, municipalities will face continued pension funding pressures. This reduces financial flexibility. Citizens may see fewer services and less infrastructure investment as pension costs crowd out other spending. Discrepancy between issuers with well-funded and poorly-funded pensions will continue to play out in market valuations. And as spreads widen for municipalities with fiscal issues, including pensions, they will be required to pay a higher cost of borrowing when bringing new debt to the capital markets. We also anticipate the difference between the performance of revenue bonds versus GOs with poorly-funded pensions is likely to continue. Overall, prolonged pension challenges will result in continued scrutiny from market constituents. For municipal investors, active management is and will continue to be increasingly important. Proactively managing credit risk means conducting thorough credit research on every bond before buying it, including analyzing the bond's indenture, conducting timely surveillance on holdings, and having in place an effective sell discipline to execute portfolio changes as needed.

Congratulations; if you made it through this piece you are now officially a "muni geek with an advanced degree"!

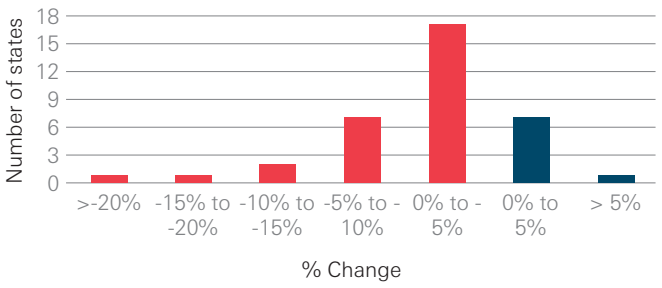
# Appendix

## NET STATE WEIGHTED-AVERAGE PENSION FUNDED RATIO; FISCAL YEAR 2017[18]




Note: Red text indicates 2016 valuation data.

## CHANGE IN STATE FUNDING LEVELS, 6/30/2014-6/30/2017[19]




## 10-YEAR CAPITAL MARKET RETURN PROJECTIONS[20]

| Asset class | Projected 10 year return | Projected 10 year standard deviation |
|---|---|---|
| **Alternatives** | | |
| Cash equivalents | 2.25 | 0.9 |
| Commodities | 2.65 | 18.3 |
| Hedge funds | 5.05 | 9.15 |
| Private equity | 7.35 | 32.9 |
| Real estate | 5.75 | 16.35 |
| **Equities** | | |
| Broad US equity | 6.85 | 18.25 |
| Large cap | 6.75 | 17.4 |
| Small/mid cap | 7 | 22.6 |
| Global ex-US equity | 7 | 21 |
| Developed Non-US equity | 6.75 | 19.7 |
| Emerging market equity | 7 | 27.45 |
| **Fixed Income** | | |
| Short duration | 2.6 | 2.1 |
| US fixed | 3 | 3.75 |
| Non-US fixed | 1.4 | 9.2 |
| TIPS | 3 | 5.25 |
| Emerging market debt | 4.5 | 9.6 |
| High yield | 4.75 | 10.35 |
| Long duration | 3 | 10.95 |

**Sources**

[1] Federal Reserve, Morgan Stanley Research; as of 3/31/2018

[2] Center for Retirement Research at Boston College Public Plans Database
- How Did State/Local Plans Become Underfunded?; January 2015; 150 plans in database
- Asset allocation for state and local pensions, 2001-2017; 180 plans in database
- Average pension contribution paid as a percent of total requirement for state and local plans, 2001-2017; 180 plans in database

[3] Loop Capital Markets
- Fiscal year 2017 state weighted-average pension funded ratio; as of 9/5/2018. Several states still reporting fiscal year 2016 including AK, LA, MA and NJ.
- Map in appendix as of July 2018.

[4] Callan Associates; as of 6/30/2018

[5] Prequin's All-Strategies Hedge Fund Index; 10-year annualized return through 12/31/2017

[6] Morningstar; as of 12/31/2017
- Bloomberg Commodity Index; 10-year annualized return through 12/31/2017
- Morningstar S&P equity return; 10-year annualized return through 12/31/2017

[7] Center for Retirement Research at Boston College Public Plans Database
- How Did State/Local Plans Become Underfunded?; January 2015; 150 plans in database
- Asset allocation for state and local pensions, 2001-2017; 180 plans in database
- Average pension contribution paid as a percent of total requirement for state and local plans, 2001-2017; 180 plans in database

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- Average pension contribution paid as a percent of total requirement for state and local plans, 2001-2017; 180 plans in database

**Sources** (continued)
[9] NASRA Public Fund Survey Fiscal Year 2016; November 2017
[10] U.S. Census Bureau: An Aging Nation: The Older Population in the United States; May 2014
[11] Build America Mutual: Public Pension Risk Series: Asset Allocation and Demographics; May 2018
[12] Moody's, S&P Capital Markets, and Fitch Ratings; as of 9/18/2018
[13] Loop Capital Markets
_ Fiscal year 2017 state weighted-average pension funded ratio; as of 9/5/2018. Several states still reporting fiscal year 2016 including AK, LA, MA and NJ.
_ Map in appendix as of July 2018.
[14] Thomson Reuters
[15] Moody's fiscal year 2016 adjusted net pension liability as a percentage of total governmental funds revenues; monthly trend average as of September 2018; 1/03/2006=100
[16] Bloomberg; Total return of general obligation versus revenue indices 1/1/2010- 6/30/2018
[17] Milman 2015 Public Pension Funding Study; November 2015
[18] Loop Capital Markets
_ Fiscal year 2017 state weighted-average pension funded ratio; as of 9/5/2018. Several states still reporting fiscal year 2016 including AK, LA, MA and NJ.
_ Map in appendix as of July 2018.
[19] Loop Capital Markets
_ Fiscal year 2017 state weighted-average pension funded ratio; as of 9/5/2018. Several states still reporting fiscal year 2016 including AK, LA, MA and NJ.
_ Map in appendix as of July 2018
[20] Callan Associates; as of 6/30/2018

**Definitions:**
A pension plan funded ratio refers to pension plan assets divided by liabilities.

Generally Accepted Accounting Principles (GAAP) are a set of rules that encompass the details, complexities and legalities of business and corporate accounting.

A general obligation (GO) bond is a type of municipal bond secured by the issuing state or local government's pledge to use legally-available revenues (e.g. property tax revenues) to repay bondholders.

The Governmental Accounting Standards Board (GASB) is an independent private sector organization which establishes GAAP used by state and local governments in the United States.

Thomson Reuters Municipal Market Data (MMD) is a triple-A yield curve benchmark scale.

The net pension liabilities (NPL) is the difference between the total pension liability, the present value of projected benefit payments to employees, and plan assets, investments held in a trust to pay current employees and retirees. Plan assets are typically reported at fair market value.

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