

# Revised Pension Risk Measurements

## Enhancing Pension Analysis in U.S. Public Finance Tax-Supported Rating Criteria Special Report

Today, Fitch has released an update to its "U.S. Public Finance Tax-Supported Rating Criteria." The only material changes relate to the analysis of defined benefit pension liabilities, incorporating enhanced reporting under GASB standards in recent years. This report discusses those changes and the rationale behind them in more detail.

**Refined Adjustment of Pension Liabilities:** Fitch Ratings has refined its method for adjusting the reported defined benefit pension liabilities of most state and local governments. Under the revised method, pension liabilities are discounted at a fixed 6% investment return assumption, and the degree of the resulting upward liability adjustment is based on newly reported sensitivity data. The refined pension liability adjustment replaces the 7% return assumption and is a part of Fitch's long-term liabilities-to-income key metric for tax-supported entities.

**Less Robust Asset Growth:** Despite recent market gains, relatively limited pension asset growth is likely during the current economic expansion compared to prior expansions. Expectations for returns are dampened by the slow pace of economic growth, driven by a variety of factors. In this environment, Fitch believes that lowering its standard investment return assumption to 6% from 7% better reflects the magnitude of the burden posed by pension commitments.

**Sensitivity Allows More Precision:** The net pension liability (NPL) sensitivity data disclosed under GASB statements 67 and 68 enable a more precise estimate of the degree to which the total pension liability (TPL) rises for a given drop in the investment return assumption. These data also provide a measure of the average time over which future benefits are projected to be made, capturing each system's relative maturity in Fitch's revised adjustment. Fitch has long noted the implications of rising maturity on pensions' cash flows and investments.

**Introducing Supplemental Cost Metric:** Fitch will compare its existing metric for the carrying cost of long-term liabilities, which relies on the actuarially determined employer contribution (ADC) for pensions, to a new, supplemental metric that estimates a hypothetical pension cost using a level repayment of the Fitch-adjusted NPL in a manner similar to bonded debt and the adjusted cost of newly accrued benefits. The result highlights outliers where expenditure flexibility can be expected to decrease substantially and unavoidably over time to meet pension obligations.

**Pensions Remain a Credit Concern:** Pension liabilities and the cost of supporting them remain a source of uncertainty for governments given the generally irrevocable nature of vested benefits, the variable nature of reported liabilities and the rising burden of contributions relative to resources. Recent GASB reporting enhancements provide the basis for analytical changes described in this report. Fitch will continue to incorporate new data into its analysis to better capture the credit risks posed by pensions.

**Implementation with New Criteria:** The changes to Fitch's pension analysis are effective as of May 31 upon publication of the updated "U.S. Public Finance Tax-Supported Rating Criteria." Fitch expects revisions to its analysis will have only limited impact on current ratings given that existing through-the-cycle key rating factor assessments already capture our expectation for rising pension burdens. However, both metrics are expected to better identify situations in which pension risk factors may affect credit quality over time.

### Related Research

[2016 State Pension Update: New Accounting, Old Challenges \(November 2016\)](#)

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## Conveying Pension Risks More Effectively

Fitch believes the refinements to its analysis of U.S. state and local government defined benefit pension liabilities more effectively convey the magnitude of credit risks posed by tax-supported entities' pensions. Using recently added accounting valuation data provided under GASB statements 67 and 68, the adjustments promote clarity and comparability in this particularly complex area of credit analysis. These methods and calculations are estimates for use in Fitch's credit analysis, rather than corrected or improved versions of existing valuation data and methodologies. Fitch expects to provide additional commentary and research in the coming months on topics discussed herein.

## Adjusting Liabilities More Precisely

Fitch is refining the way it adjusts the reported NPL of state and local governments, which it uses as part of its assessment of each entity's long-term liability burden. Both components of the adjustment — the target investment return assumption and the magnitude of the resulting change to the TPL — are being revised. The resulting adjusted NPL provided by the new formula is replacing the previous adjusted NPL used by Fitch in its liabilities-to-income metric.

First, for the target long-term investment return assumption, Fitch is adjusting the reported TPL upward to reflect a fixed, 6% nominal investment return assumption for systems that report an assumption above 6%. The fixed 6% rate is replacing the fixed 7% rate used by Fitch in its pension analyses since 2011.

For the relatively small number of systems that report asset depletion dates and a single equivalent discount rate at or below 6%, Fitch will continue to use the NPL as reported. This currently includes only a handful of major systems that are often troubled and many smaller or closed systems that are explicitly pay-as-you-go.

Second, the magnitude of the upward TPL adjustment now is being calculated individually for each reported system based on the NPL sensitivity data disclosed in audited financial statements under GASB statements 67 and 68. The resulting system-specific adjustment is replacing Fitch's previous approach of making an 11% adjustment for each 1% difference between the assumed return and Fitch's standard 7% return assumption.

## Sensitivity Adds Insight

The inclusion of NPL sensitivity data is among the most important improvements made under the recent GASB accounting changes. For purposes of the refined NPL adjustment, the sensitivity data allow Fitch to calculate how much each reported TPL increases or decreases given a 1% change in the opposite direction of the reported investment return assumption. By applying a formula for effective duration with a modification for convexity to the resulting TPL sensitivity, a 1% drop in the investment return assumption yields an average 11.1% increase in the TPL, with most falling between 9% and 15% and a smaller share of outliers due to individual system characteristics.

Fitch scales the 1% sensitivity to reflect the actual spread between each system's return assumption and the 6% target return assumption. For most systems, the actual spread ranges from 1.0%–2.0%, with a typical adjustment of about 1.6% based on the 7.6% average reported investment return assumption as of fiscal 2016 pension system financial statements (*see box on the next page for more information*).

### Related Criteria

[U.S. Public Finance Tax-Supported Criteria \(May 2017\)](#)

**Capitalizing on New Sensitivity Data**

To estimate the impact of a 6% investment return assumption, Fitch uses NPL sensitivity data now reported in financial statement notes under GASB 67 and 68. Pension disclosures include the NPL not only at the reported investment return assumption, but also based on both 1% lower and 1% higher investment return assumptions. Adding back the fiduciary net position (FNP, or system assets reported at fair market value) to each NPL results in a range of TPLs under three discount rate scenarios.

As with the relationship between a bond's price and yield, the relationship between the TPL and the investment return assumption is dynamic, varying for each plan based on the magnitude and direction of a given rate shift. Fitch captures this dynamic relationship by applying a formula for effective duration and convexity to the TPL sensitivity noted above in a manner analogous to a bond pricing formula. For a given 1% downward shift in the discount rate, the formula results in a TPL increase typically between 9% and 15% for most plans. Correspondingly larger downward discount rate shifts produce larger TPL increases.

Besides enabling a more precise TPL adjustment, the duration formula result also shows the weighted average years over which accrued benefits will be paid, allowing each plan's relative maturity to be assessed. Each system has a different maturity profile, linked to individual demographic and benefit characteristics, among other factors. Rising maturity (reflected by falling duration) is not an acute challenge, but as a trend, it often corresponds with other pension-related risks. The rising maturity of pension systems has numerous implications over time, including higher benefit outlays and lower employee contributions, and often encourages asset allocation changes in an effort to respond to shifting cash flow trends.

**Limited Impact on Liability Assessments**

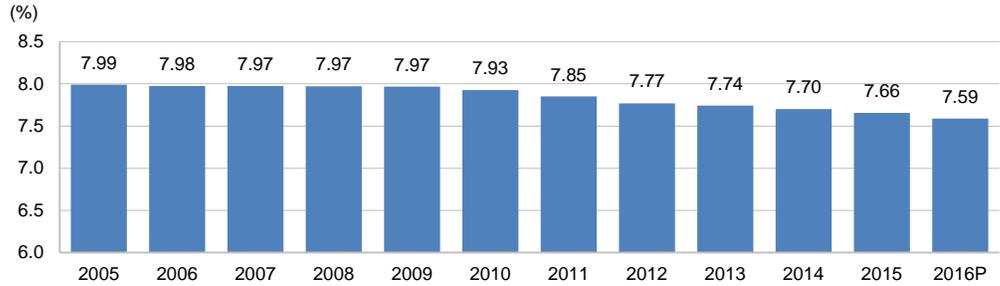
Although Fitch expects the liabilities-to-income metric to be higher for most rated entities using the revised NPL adjustment, few changes to long-term liability burden key rating factor assessments and, thus, few changes to existing ratings are expected.

Due to the forward-looking orientation of Fitch's "U.S. Public Finance Tax-Supported Rating Criteria," the long-term liability assessments assigned by Fitch incorporate both the current liability-to-income metric and the expected trajectory of the NPL and other liabilities over time. Factors that Fitch views as weaknesses likely to drive the NPL higher over time — such as using an above-average investment return assumption, long or rolling amortization or an otherwise insufficient commitment to paying the full ADC — have typically resulted in a weaker long-term liability assessment than the level implied by the liabilities-to-income metric alone.

**Capturing Impact of Lower Market Returns**

Fitch regards the trend of pension systems lowering their investment return assumptions as a positive credit factor, despite the offsetting increase to reported pension liabilities and consequent rise in the ADC. Since 2008, virtually all major systems have lowered their nominal investment return assumptions, simultaneously increasing their NPLs (in the accounting valuation) and their unfunded liabilities and actuarial contributions (in the funding valuation). For approximately 100 major systems, Fitch estimates the average return assumption fell to 7.6% as of pension systems' fiscal 2016 financial reports, down from 8% in 2008. Fitch expects this trend to continue into 2017, with several major state systems having announced reductions to 7% or lower, including ones in California, Connecticut, Hawaii, Iowa and Kentucky.

**Major Pension Systems' Average Investment Return Assumption**  
(As of Fiscal Year End)



P – Projected.  
Source: Fitch.

Under its revised methodology, Fitch is taking this trend one step further by shifting the return assumption to a fixed 6% target for most plans reported by state and local governments. The change is motivated specifically by Fitch’s expectation for continued subdued economic and investment portfolio growth and the need to estimate the potential impact of this risk on pensions. The 6% target is not derived from a formal forecast but rather allows an estimate of the impact of a more conservative, albeit reasonable, return assumption on reported NPL and ADC.

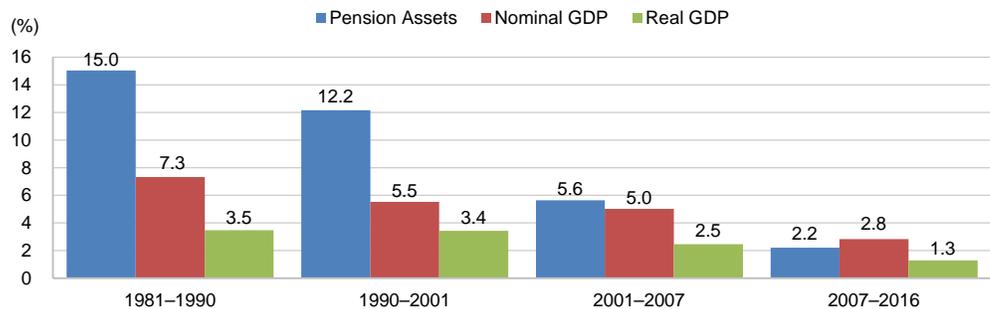
**Recent and Historical Investment Experience Diverge**

Fitch’s baseline expectation is that pension investments will grow on a real basis over long-term horizons consistent with the economy as a whole. However, the performance of pension portfolios over shorter horizons is subject to cyclicity, much like the economy, and can also experience multiyear periods of below-average growth tied to underlying macroeconomic trends and market valuation considerations.

Fitch believes current long-term investment return assumptions are reasonable for describing average historical portfolio growth over the three decades that ended in 2008. However, they are high relative to more recent experience.

Actual pension balances (reflecting the impact of investment returns, contributions, benefit payments, expenses and other factors) in past decades commonly rose annually in excess of the 8% or higher level targeted by pension managers. Based on Federal Reserve Bank data, Fitch estimates pension assets rose an average of 9.4% annually in the 30-year period ended in 2008 and 5.4% on a real basis, reflecting three successive strong economic expansions in the 1980s, 1990s and 2000s. More recent pension portfolio growth has not matched longer term experience on either a nominal or real basis. Over the seven years from 2009 to 2016, Fitch estimates pension asset balances rose only 5.1% on a nominal basis and 3.4% on a real basis.

**Average Annual Growth by Business Cycle**



Source: Federal Reserve Bank economic data, Federal Reserve Board of Governors flow of funds.

## Less Robust Macroeconomic Environment

Fully exploring the direct links between the economy and pension portfolio performance is beyond the scope of this report. However, as measured by real GDP, U.S. growth has been slower and more incremental over the current economic expansion than over longer time horizons, and there is little evidence to suggest the economy will accelerate to previous levels of growth in the near term. An aging work force, declining work force participation, flat productivity and subdued wage gains have all restrained faster economic expansion. The last such period of extended slow real GDP growth extended through much of the 1970s and into the 1980s. Fitch believes pension systems will be hard-pressed to achieve their long-term growth expectations in the current economic context.

The decades-long decline in market interest rates to the historical low level of the last few years poses an additional challenge for pensions in meeting their long-term investment return assumptions. Simultaneous with market rates edging lower, pension portfolios have shifted into broader ranges of equity, fixed income and alternative assets with the intention of preserving long-term returns but often at the cost of exposure to short-term volatility. Among some outliers, exposure to unusually risky asset classes is well beyond what is typical for pensions with very long-term liabilities and ultimately raises the risk that pension sponsors and participating governments will have to absorb the heightened risk of return underperformance.

## 10-Year Nominal Treasury Rates



Source: Federal Reserve Bank economic data.

## Proxy for Other Pension Risks

Fitch believes that adjusting the NPL to a lower discount rate can provide a stand-in for other pension risks that are more difficult to assess than the plan's ability to achieve target investment returns. In contrast to defined contribution pensions, defined benefit pensions carry inherent risks for the system's sponsor and participating governments up until the moment when the benefit payment extinguishes the liability. These risks leave sponsors and participating governments exposed to potentially higher liabilities and higher contributions over that time frame. Unfavorable changes arising from actuarial updates (including periodic valuations, experience studies and mortality expectations) and from government policy choices (including hiring, benefit levels and actual contribution practices) typically translate to higher contributions.

## Highlighting Potential for Rising Contributions

In addition to revising the Fitch-adjusted NPL to reflect a lower standard investment return assumption, Fitch is introducing a supplemental carrying cost metric as part of the updated criteria. Like the carrying cost metric, which includes the ADC as well as amounts for debt

service and other post-employment benefit (OPEB) pay-go, the supplemental metric incorporates a component for pensions, the pension benchmark. However, the pension benchmark is estimated by Fitch for purposes of the supplemental metric, starting with the Fitch-adjusted NPL at 6%, and is calculated in a consistent manner across all systems assuming a standard set of payoff assumptions.

The supplemental metric is not intended to replace Fitch's existing metric for the carrying cost of long-term liabilities used in its assessment of expenditure flexibility, nor is the pension benchmark used in the supplemental metric intended to represent an improved version of a funding contribution. Rather, the supplemental metric is intended to identify outlier situations in which expenditure flexibility can be expected to decrease substantially and unavoidably over time as a result of pensions. Funding assumptions reflect the policy choices made by each pension system, making the reported ADC the most realistic baseline for what governments will seek to contribute. However, Fitch expects the supplemental metric will help reveal the impact on contributions both of subdued returns and whether a plan's funding assumptions support the eventual paydown of pension liabilities.

### Two-Part Benchmark

As with the ADC used in the carrying cost metric, the pension benchmark used in the supplemental metric captures two components — an annual payment amount for amortizing the liability (in this case the NPL) over time and an amount for newly earned benefits (the service cost) (*see box below*).

#### ***Estimating a Benchmark for the ADC***

The NPL sensitivity data disclosed in the financial statement notes and several data points disclosed in the schedule of changes to the NPLs provide the basis for calculating the pension benchmark. Using the reported NPL, adjusted upward to reflect the 6% return assumption based on reported sensitivity data, Fitch calculates an annual level dollar payment for a 20-year period, assuming a 5% interest rate, approximating a typical long-term municipal bond rate, consistent with how most bonded debt is amortized. The reported service cost is also modified to reflect the impact of the 6% return assumption and the NPL sensitivity, with Fitch assuming duration associated with service cost is double the duration associated with the TPL. Because the reported service cost is a prior-year figure, Fitch also modifies it to reflect payroll growth, offset by employee and non-employer contributions (likewise modified to reflect payroll growth) and administrative expenses (modified to reflect inflation). Of note, the rates and adjustments used in the formula are intended primarily to promote comparability, but Fitch may periodically alter them based on market, pension or credit quality factors.

### Improved Assessment of Funding Assumptions

The ADC and its predecessor, the annual required contribution (ARC), have long been considered the de facto standard for contribution sufficiency. However, the ADC is not a comparable benchmark across systems because of wide differences in each system's funding policies. Some combinations of assumptions result in an ADC that is inadequate for paying down pensions over time. For example, systems that assume long, open amortization periods with gradual, backloaded amortization methods calibrated to grow with payroll may never reach full prefunding of liabilities, even if investment return assumptions are achieved.

In most cases, Fitch expects the pension component of the supplemental cost metric to be higher than the reported ADC, largely due to the 6% investment return's impact on the Fitch-

adjusted NPL and the replacement of long, backloaded amortization under funding policy assumptions with a shorter, level-dollar amortization. Despite this, a large variance between the two figures may not translate to a correspondingly large increase in overall carrying costs, given that pensions is only one of the three components of carrying costs, along with debt service and OPEB pay-go amounts.

### **Evolving Approach to Measuring Risk**

Assessing the credit impact of pensions is challenging given the variable nature of the liability, the fixed nature of benefit promises and the range of risks assumed by governments offering pension benefits. Despite these challenges, Fitch's believes it is important to consider pensions as a long-term liability akin to bonded debt.

This stance is consistent with the generally irrevocable nature of promised benefits in most U.S. jurisdictions, which limits the ability to roll back benefits either through reforms or in the context of municipal bankruptcy. Case law on the degree to which accrued benefits can be revised is rapidly evolving as judges consider legal challenges to reforms sought by states and local governments. Recent bankruptcies have shown a clear preference for preserving accrued pension benefits over bonded debt, even if judges in two of those cases — Stockton and Detroit — asserted the power to impair pension benefits to a greater degree than in the ultimate settlements.

The refinements Fitch is making to its analysis of defined benefit pensions capitalize on recent changes to pension accounting disclosure; however, Fitch recognizes that assessing pension-related risks requires assimilating data well beyond what is provided in financial statements alone.

Data and disclosure on pensions has changed materially in recent years, and Fitch anticipates it will continue to change, providing new avenues for capturing the credit impact of pensions in Fitch's ratings. Accounting valuation data available under GASB statements 67 and 68 have improved the comparability of reported liabilities and revealed the impact of deviating from targeted investment returns. The older funding valuations, which assess funded status and gauge necessary contributions, still remain essential to understanding the manner in which the sponsoring and participating governments measure and intend to pay down the liability over time. Fitch expects alternative measures of public pensions will evolve as actuaries and sponsors seek new tools for measuring and disclosing pension risks and as investors and other market participants demand it.

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