Amid market volatility and fiscal uncertainties, the number of states requiring their public retirement systems to undergo standard financial stress tests is on the rise. The tests help officials and plan members assess how their plans would fare under different economic and investment-return scenarios.

Stress testing aims to refine, enhance and formalize the work states are already doing to evaluate their pensions’ exposure to risk. Making the results public, and more transparent to policymakers and plan members, supporters say, will provide important context for discussions about how the plans are designed and funded.

There are several simulation techniques that can help measure the soundness of pension plans. Sensitivity analysis looks at the liability side of the equation, quantifying risk by asking how much liabilities would rise if plans assume, for example, a return of 6 percent rather than 7 percent. Stress testing evaluates the health of plans against several economic factors, like market volatility, contribution policies and state revenue forecasts. Scenario testing looks at how economic shocks like recessions can affect a plan’s financial condition.

A conversation about the mechanics of stress testing gets very technical, very fast. But essentially, these measures all tell a story about risk, because risks to the market create risks for pension funds. What happens if things don’t go as expected? How much risk is a pension plan taking on, and who bears it?

The Great Recession’s Legacy

The Dodd-Frank Wall Street Reform and Consumer Protection Act, passed in response to the financial crisis of 2008, requires large financial institutions to conduct annual stress tests and report the results to the Federal Reserve. Recent jolts to the market have led some financial experts to encourage more widespread use of these tests, and the enthusiasm has spilled over to public retirement systems. Legislation to require these tests has really gained traction in the last couple years.

The Pew Charitable Trusts reports that state and local governments are facing $1.7 trillion in unfunded pension liabilities as of fiscal year 2017. “When you talk about billions of dollars of unfunded liabilities, it can be overwhelming,” said Susan Banta, director of research for Pew’s Public Sector Retirement Project. She told lawmakers and legislative staff at an NCSL meeting in Chicago this spring that, to help manage these liabilities, state pension plans increasingly have relied on riskier, more complex investments that track market volatility. They are more vulnerable to economic downturns as a result.

Recent all-time market highs only intensify concerns about what could go wrong. “It’s time to start figuring out on a case-by-case basis what kind of risk we are actually exposed to,” she said. “The measures we’ve been using in the past are not really adequate. Stress testing is a much more comprehensive tool and provides a lot of answers.”

States Measure Stress

California, Colorado, Connecticut, Hawaii, Kentucky, New Jersey, Vermont, Virginia and Washington perform regular stress tests on their large public retirement systems and report the results. Lawmakers

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in Connecticut, Hawaii and Virginia passed those requirements in 2017. This year, New Jersey passed legislation, and Minnesota has a bill pending.

Studying the possible impact of different economic and capital market scenarios has been a regular risk-management practice at the $306.6 billion California Public Employees’ Retirement System for years. CalPERS, as it’s known, relies on complex stochastic analysis (more on that later). Rather than making sweeping policy changes all at once, this tool led policymakers to take a measured approach to mitigating risk. CalPERS waits until pension fund investments yield better-than-expected returns, then uses some of the surplus to reduce the riskiness of its portfolio or to lower investment-return assumptions.

In Washington, the Office of the State Actuary has, for several years, examined pension plan funding data and reported on how investment and other types of risks could play out. It tests a range of assumptions about new workers, revenue growth and potential policy changes—kicking the tires, so to speak, on various assumptions—to see how much each might affect the long-term health of its public employee plans.

Michigan’s work began with a task force convened by the governor and made up of local government, labor, health care and retirement experts. The group addressed local revenue challenges, health care costs that consistently outpace inflation and shifting workforce demographics. Senator Jim Stamas (R), the architect of the state’s bill, said the task force concluded that “one of the largest problems in Michigan was that everything was being reported differently.”

New, comprehensive risk-reporting standards have changed that. Based on the task force’s recommendations, lawmakers passed legislation in 2017 requiring localities to routinely stress test their pension and retiree health benefit plans and report uniform data to the state treasury. The goal is to identify when funding levels drop too low or employer contributions exceed a certain percentage of the locality’s revenue.

A special board within the treasury may then impose a plan to correct problems.

New Jersey and Virginia codified many existing data analytics and reporting practices in their stress testing legislation, which also requires the monitoring and public reporting of fees charged by external money managers. In New Jersey, the legislation will affect five of the seven pension systems in the perennially underfunded New Jersey Pension Fund. It passed with broad bipartisan support.

“There are many obvious reasons why we should be performing routine health checks on our pension systems,” said the bill’s sponsor, then-Assemblyman Troy Singleton (D), who now serves in the Senate. “The record number of credit downgrades...
we’ve received over the last eight years was due in no small part to the insolvency of our pension systems. Fees paid to outside investment managers also skyrocketed in that time. A stress-test analysis, particularly one that is forward-looking, is a wise move and will prove enormously beneficial in detecting potential crises on the horizon that we may need to address.”

**Mother of All Actuarial Assumptions**

Defined benefit pension plans have lots of moving parts that can ultimately affect funding levels. Plan sponsors might not contribute the required amount or the required amount might not be enough. Then there are variables like shifting demographics, mortality and retirement rates. Long-term salary changes for employees or unexpected changes in inflation can also affect benefit levels. And, finally, there’s always the difference between the assumed and actual rates of investment return on a fund’s assets.

According to the Federal Reserve, state and local government retirement systems held assets of $4.16 trillion as of Sept. 30, 2017. The enormous scale of these assets means that even tiny changes in assumptions about investment returns can have huge consequences. Serious problems for plan financing and funding levels arise when actual experience differs from expectations.

If long-term earnings lag behind assumptions, the difference has to be made up somehow—either through higher contributions or reduced benefits. If the assumed rate is too low, then pension liabilities appear larger than they really are, and current taxpayers pay the price. If the assumed rate of return is set too high, it understates liabilities, leaving future taxpayers on the hook.

So what’s wrong with expecting the same return every year? Since pensions invest for the long haul, doesn’t it all even out? Not exactly. Plans see a range of returns over time. If a significant market drop comes early in a cycle, even if it’s followed by years of returns that exceed the assumed rate, required contributions can spike and remain quite high to make up the shortfall.

**New Tools: What, How and Why?**

New rules issued in 2012 by the Government Accounting Standards Board require public pension plans to estimate liabilities based on projected returns one percentage point above and below their assumed rates of return.

In 2014, an independent panel commissioned by the Society of Actuaries recommended additional risk measures, analyses and disclosures for pension plans. They include rigorous stress testing with 30-year financial projections based on returns at a standardized baseline and at three percentage points above and below the baseline. The report also called for simulations when funding entities are making only 80 percent of their recommended contributions.

A stress-testing model developed by Pew likewise looks at economic scenarios and contribution behaviors, and has helped shape the legislative debate in states from Hawaii to Minnesota. The model generates a range of likely outcomes and includes budget impact measures based on a state’s specific revenue forecast. It tests a range of lower-than-expected investment return scenarios along with behavioral assumptions about how policymakers might respond.

It also allows for stochastic analysis that looks at thousands of potential outcomes and their likelihood of occurring. A similar method was employed in Colorado to gauge the effectiveness of pension reforms adopted in 2010. Results showed that, despite increases in employer and employee contributions and reductions in post-retirement cost-of-living increases, the state-sponsored plan faced a 23 percent chance of insolvency over the next 20 to 30 years. Equipped with this knowledge, policymakers are now debating further reforms to prevent such an outcome.

An actuarial experience study is another tool for disclosing stress-testing numbers, but it is performed at three- to five-year intervals. Many believe annual reporting is better because it reveals problems sooner, leaving more time to address them.

**Costs, Benefits and Caveats**

So what are the benefits of performing stress testing and making the results public? How can stakeholders the public make sense of and use the information? And what are some important caveats?

Some policymakers worry that stress-testing requirements create additional administrative burdens. They contend that current practices are sufficient. Experts at Pew counter that because public pension stress-testing models build on existing reporting practices, the analysis remains affordable for tight government budgets, while accounting for each state’s economic idiosyncrasies under a range of possible scenarios.

State legislators have a vital role in the oversight of retirement systems. Stress-testing legislation often wins bipartisan support and can help pension plan administrators and policymakers prepare for the next economic downturn. It can also be a useful tool when scoring—or estimating formal costs for—proposed plan reforms. A fuller understanding of how market fluctuations and human behaviors can shape pension fortunes can lead to better funding policies and, possibly, lower plan costs.