The Public Pension Crisis

By Ronald J. Ryan, CFA®

According to an October 2010 study by Professors Robert Novy-Marx and Joshua Rauh (2010), if state and local pensions were marked to market, their combined deficit would exceed $3.3 trillion. If TARP I was a national emergency at less than $1 trillion, what do you call this financial situation? Such a combined pension deficit has created a significant budget crisis for many cities and states. Due to spiking pension contribution costs, most cities and states were not prepared for such budget escalations and the result has been deep budget deficits.

The spike in contribution costs is the result of pension asset growth being insufficient to fund pension benefit payments. This shortfall in asset growth is funded by an annual pension contribution that is an added pension cost factor. Perhaps the clearest example of such escalating contribution costs is the New York City Employees Retirement System (NYCERS), the largest of five New York City pension funds. Table 1 shows its history of contribution payments and the growth over the past decade.[1]

NYCERS contribution costs increased more than 30 times in nine fiscal years equal to 46.64-percent annual growth. How could any budget keep up with such rising costs, especially costs that were unforeseen and misunderstood? Indeed, how did pension contribution costs explode, creating today's public budget crises? Moreover, how do we solve this problem and prevent it from surfacing again?

The Problems

The villain of our story is the Governmental Accounting Standards Board pension accounting rules 25/27, which have misled pensions with inappropriate valuations of both pension assets and liabilities. This caused the funded ratios (present value of assets/liabilities) to be greatly exaggerated, which led to inappropriate asset allocation, benefit, and contribution decisions. When I testified before the ERISA Committee in 2003, I brought along a five-foot pencil that I introduced as "Woody, the weapon of mass destruction in financial America." Indeed, if you thought Enron and WorldCom had magic accounting pencils that led to their debacles, wait till you see what the pension pencil "Woody" can do.

Instead of marking to market, GASB ("Woody") allows public pension plans to smooth assets over a moving five-year average. Imagine the stock that went from $100 to $80 to $60 to $40 to $20 to $0 over five years (not unlike General Motors during 2003–2008). On average it is a $50 stock, and that average seriously overvalues this asset. Of course, it could go the other way, too, as it did in the late 1990s. The point here is that a five-year *average* price or valuation is not a reflection of reality, is deceptive, and is likely to steer you into the wrong decision(s) affecting your assets. Table 2 shows our estimate of the growth rates of pension assets and liabilities for the 11 years ending December 31, 2010, based on calculations at my firm, Ryan ALM.[2]

Based on market valuations shown in table 2, Ryan ALM calculations estimate that pension assets would have grown by 34.44 percent and pension liabilities would have grown by a cumulative 150.11 percent over this period. As a result, pension liabilities should have outgrown pension assets by 115.67 percent over the past 11 years. This would have caused funded ratios to deteriorate by −46.25 percent, requiring a funded ratio of 186.04 percent in 1999 to be fully funded today. Moreover, given a deficit the assets have to grow faster to catch up to liabilities. A 50-percent funded ratio suggests assets have to grow twice as fast as liabilities to catch up, a 75-percent funded ratio requires 33 percent more asset growth, etc.

GASB rules allow pension liabilities to be valued at a discount rate equal to the return on asset (ROA) assumption. Based on a 2010 study by the Center for State and Local Government Excellence,[3] the average ROA used by public pensions is 8 percent. Such an ROA tends to be a static and robust projection. This annual

TABLE 1: NYCERS HISTORY OF CONTRIBUTION PAYMENTS

Fiscal Year Ended	Annual Required Contribution	Employer Rate of Contribution (%)
6/30/00	$68,619,745	0.915
6/30/01	100,024,692	1.271
6/30/02	105,660,069	1.241
6/30/03	197,823,998	1.213
6/30/04	542,229,450	3.526
6/30/05	1,020,379,985	8.985
6/30/06	1,024,358,175	11.142
6/30/07	1,471,029,609	15.556
6/30/08	1,874,242,487	19.001
6/30/09	2,150,438,042	20.570

TABLE 2: ESTIMATED GROWTH RATES OF PENSION ASSETS AND LIABILITIES BASED ON RYAN ALM CALCULATIONS											
Total Returns											
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Assets	−2.50	−5.40	−11.41	20.04	8.92	4.43	12.25	6.82	−24.47	19.43	11.89
Liabilities	25.96	3.08	19.47	1.96	9.35	8.87	0.81	11.76	33.93	−19.52	10.13
Difference											
Annual	−28.46	−8.48	−30.89	18.08	−0.43	−4.44	11.44	−4.94	−58.40	38.95	1.76
Cumulative		37.60	−73.40	−60.08	−66.13	−76.75	−64.60	−78.38	−181.57	−106.94	−115.67
Fund Ratio	77.41	71.04	52.68	62.01	61.76	59.25	65.97	63.22	35.66	52.91	53.75

growth rate contrasts sharply with the history of liability growth rates, which are quite volatile with high positive and high negative annual growth rates. GASB accounting rules ignore this reality and true economic valuations. Indeed, such accounting rules were established to avoid volatility in contribution costs by smoothing assets and keeping liability growth a constant. In the end these accounting rules created volatile contribution costs, added benefit costs, and produced inappropriate asset allocation by misleading pensions about the proper economic valuation of their funded ratios.

The worst consequence of the GASB ruling may be its effects on asset allocation, benefit, and contribution decisions, all of which are based on the ROA … it all links. Because GASB made the ROA the liability growth rate, the ROA became the target growth rate for assets. This logic follows the way actuaries calculate projected contribution costs.

The annual required contribution (ARC) is the balance item between the annual projected future values of assets and liabilities. Actuaries grow the assets at the ROA. Liabilities are first discounted at the ROA, and then they also grow at the ROA. Any annual funded ratio dollar deficit becomes the projected ARC, which needs to be fully funded for that fiscal year. So the ROA's main utility is to calculate contributions.

According to the GASB rules, pensions are told that when assets don't grow at the ROA the result is an

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actuarial and GASB accounting deficit, which must be funded through extra contributions. But this is incorrect thinking. If there is a deficit, then contribution costs go up even if the assets grow at the ROA, because assets have to outgrow liabilities to reduce contribution costs and reach full funding. Note that, with a surplus, assets don't need to work as hard as the ROA. If assets match liability growth, all is well. In other words, liabilities yielding 4 percent require 4-percent asset growth, not the ROA of 8 percent. Indeed, assets and liabilities never grow at the ROA.

The ROA needs to be validated by an asset allocation model. Usually the pension consultant is required to come up with an asset allocation that has the highest probability of achieving the ROA. Asset allocation models use an optimization technique based on the average returns from long historical index data bases (usually about 20 years) for every asset class but one—bonds. Bonds go into the asset allocation models at their current yields. In the late 1990s most pension funds enjoyed surpluses and reduced, or even eliminated, contribution costs. Many

also increased benefits. One would think that a prudent pension investor would have altered the asset allocation to more and more bonds to match liabilities (i.e., immunization strategy) to lock in reduced contributions for the future. But asset allocation models are based on achieving the ROA, so the funded ratio was never considered—a fatal flaw. When bond interest rates fell below the ROA (8 percent) in the late 1980s, bonds became a drag, so the asset allocation models reduced the allocation to bonds. By 1999 most asset allocation models had the lowest allocation to bonds in modern history and the highest allocation to equities, setting the stage for the $3.3-trillion mistake. When the equity correction arrived in 2000–2002, public pensions were hit hard because asset allocations were skewed to equities. Most pension assets underperformed liability growth by more than 70 percent in just those three years (see table 2).

Pension trustees got reports that showed funded ratios based on GASB accounting—not economic reality. Such accounting overstated assets in the early 2000s by more than 20 percent due to
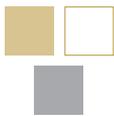
smoothing and it undervalued liabilities by 30–50 percent during most of the past 11 years. This caused a severe exaggeration of the funded ratio that led pensions to increase benefits and reduce contributions when in reality they could afford neither.

The Pension Protection Act (PPA) provides a good model. It requires private pensions to have a high funded ratio based on market values before increasing benefits. But most pensions have been misled into using the ROA rather than the funded ratio. Had pensions matched assets to liabilities using high-quality zero-coupon bonds in the late 1990s, they would have secured a fully funded position for the future and reduced or even eliminated contribution costs. Indeed, a surplus funded ratio should have a radically more-conservative asset allocation than a deficit position to secure the surplus and reduce contribution costs long-term. But in the 1990s and 2000s the opposite took place because of a secular trend toward lower interest rates, which skewed asset allocation increasingly away from bonds into riskier securities, leading to the $3.3-trillion asset allocation mistake.

The Solutions

The solution to the public pension and budget crisis starts with liabilities. Until a custom liability index (CLI) is installed as the proper benchmark, all asset allocation, asset management, benefit, and contribution decisions will be based upon erroneous and misleading calculations. The benchmark must be a CLI because no two pensions are alike due to different salaries, mortality, and plan amendments. The CLI will allow pensions to know the market value of liabilities so that the true economic funded ratio will be known frequently and accurately to inform all decisions.

Asset Allocation

Asset allocation is usually the first decision. It should be based on the economic funded ratio, not the ROA.

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A 120-percent funded ratio should be immunized with a core portfolio for most assets with a separate surplus portfolio created for excess funds as a reserve against actuarial noise in projections. A 70-percent economic funded ratio would be a more aggressive asset allocation to make up the deficit over time. Fortunately, pensions have time to cure deficits equal to the average life (duration) of their liabilities. This is best measured by the CLI. A 30-percent deficit with 10-year duration suggests that assets have to outgrow liabilities by 4.29 percent per year ($100/70 - 1$, divided by 10 years) on average for 10 years to reach full funding. If 10-year Treasury STRIPS (separate trading of registered interest and principal securities) are yielding around 3.66 percent (as they were at year-end 2010), then the assets need to grow around 7.95 percent annually to reach full funding in 10 years. However, if interest rates trend upward in the next five years, then the present value growth rate of liabilities will be less than their yield-to-maturity (YTM) of 3.66 percent. In fact with a 10-year duration, an average interest rate increase of only 50 basis points per year would cause liabilities to have a slightly negative cumulative growth over five years. If assets could grow at just 6 percent per year, then in five years the plan would be fully funded. Please note that at no time would the assets achieve the ROA growth rate. The pension growth rate objective should be positive relative growth versus liability growth and not an absolute growth rate (ROA). With the CLI in place just like a

scoreboard in sports, the pension plan could adjust its asset allocation whenever the score (funded ratio) indicates it's time to do so. A sports team that is way ahead in a game will change strategy and get conservative to preserve a lead, and the same holds for pensions. What's been missing all these years was a scoreboard (i.e., the CLI), continually measuring the score between assets and liabilities.

Separate Beta from Alpha

The next step is to separate the beta assets from the alpha assets. Beta is redefined as the portfolio that matches the liability objective. As proven through defeasance, dedication, and immunization, this must be a portfolio of high-quality bonds matched to the cash flow of the liability payment schedule. With a CLI in place, the beta portfolio is a liability index portfolio. Alpha is redefined as the excess return above the liability growth rate (return) measured by the CLI. If an equity manager outperforms the S&P 500 but underperforms the growth rate of liabilities, the pension plan loses (i.e., there is no liability alpha). The allocation between the beta and alpha assets should be based on the funded ratio. The lower the funded ratio the more is allocated to the alpha assets (and vice versa). A 70-percent funded ratio with a 10-year duration requires an alpha allocation of 75 percent. The YTM of liabilities is their growth rate to maturity. As a result, we know the true economic growth of our objective to its
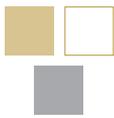
steady income stream, all without fully exposing their savings to market risk.

Conclusion

As evaluating risk becomes the starting point for discussions around asset allocation, hedged equity quickly asserts itself as an effective risk-budgeting tool. The strategy offers all of the hallmark characteristics that can help investors effectively manage risk while maintaining exposure to the stock market:

- It provides comparable rate of return on a risk-adjusted basis when conditions are normal to favorable for stocks and bonds.

- It has a limited level of volatility.
- It has a focus on limiting large losses in sudden equity market downturns.

As the emphasis shifts to risk-adjusted returns, a hedged equity strategy can provide an invaluable alternative to hedge funds by effectively protecting against downside risk over short periods of time, thus limiting loss of capital over longer periods. With a history of performing consistently across all market types and in all interest-rate environments, hedged equity may help investors experience a smoother journey on the road ahead. I&W

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payment date(s). If the alpha assets can grow at 7.66 percent and the liabilities are priced at the Treasury yield curve rates (average YTM = 3.66 percent) then a 75-percent allocation to the alpha assets reaches full funding in 10 years. Note the allocation to beta assets (bonds) is the reciprocal (25 percent) from this asset allocation process.

Performance measurement studies (i.e., PIPER)[4] prove that investment-grade bonds have little or no alpha versus a bond objective (i.e., before fees). As a result, pensions need to reconsider the use of investment-grade bonds. Investment-grade bonds should be the beta portfolio and not be actively managed versus generic bond market indexes. This rearrangement of investment-grade bonds also will save fees and eliminate tracking deviations versus liabilities. Both beta and alpha require a CLI to be managed and measured. Traditionally, performance measurement is entirely focused on the risk/reward behavior of

assets versus generic market indexes. Pension plan sponsors need to know the risk/reward behavior of their assets versus their liabilities (especially the beta assets) and the resulting funded ratio. Unfortunately, liabilities usually are missing in action at every pension investment review meeting. Given a CLI, then asset allocation, asset management, performance measurement, benefit, and contribution decisions are all in harmony with the liability objective and focused on the funded ratio.

In other words: given the wrong index objective, you get the wrong risk/reward. I&W

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Endnotes

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