

MEMORANDUM

Date: October 1, 2012

TO: NJ State Investment Council

FROM: Guy Haselmann, NJSIC Board Member

Subject: *Comments on the State of New Jersey's Actuarial Assumptions for Rates of Return on the State's Pension Funds*

Background:

The basis for this note originated from a request from several sources for the State Investment Council ("SIC" or "the Council") to comment on New Jersey's actuarial assumptions, including the expected rate of investment return for its pension funds¹. For many years, that rate was set at 8.25%, although in 2012 it was reduced to 7.95%. The authority to set that rate is granted under relevant statutes to the State Treasurer. Chairman Grady explained that the determination of the assumed rate of return was outside the mandate of the SIC, the mission of which is to provide appropriate oversight and governance to the Division of Investment with the goal of maximizing returns to the pension system's beneficiaries while managing and mitigating risk. In May 2012, the Council was presented with a resolution by Council Member Peter Maurer asking it to review, in an appropriate ad hoc subcommittee, the issues surrounding the assumed rate of return. Chairman Grady advised that the Council's Investment Policy Committee ("IPC") would be an appropriate forum in which to have the discussion and conduct any appropriate review. After discussion, the resolution passed, with the Chairman's support. After passage of the resolution, Chairman Grady asked me to draft, to help inform the IPC, a paper outlining the background of the rate of return assumption and some considerations the IPC might wish to discuss. The comments which follow are in response to the Chairman's request, and are solely based on my own assessment and opinions. They are, however, released for discussion among the SIC with the approval of the IPC.

Introduction:

Public pension structures are highly complex, particularly relating to how they are funded and how long-term liabilities and benefits are measured. This note is not meant to be comprehensive nor is it meant to address the numerous variables that influence all public sector pension matters, but rather to make some general comments and observations on appropriate discount rates, or expected rates of return.

Before diving into the matter, it would be prudent to first provide a bit of background. It is with great honor that I accepted my nomination and confirmation to the State Investment Council in 2010. I did so with the belief that I could use my 25 years of

¹ The assumption has since been lowered from 8.25% to 7.95%.

investment and business experiences to improve efficiencies and help to construct a more robust portfolio for navigating through challenging economic times. Over my career and with the SIC, I have taken my fiduciary responsibility “to maximize return per unit of risk” exceptionally seriously.

Moreover, during my time on this Council, I have attempted to stay true to all of the mandates and responsibilities of the Council, while avoiding any issues outside our domain, or which attempt to politicize the work of the Council. In my opinion, this note comes close, and veers toward a gray area. With this in mind, I wish to reiterate that this note is being written based upon a request and not attributable to any political agenda. It should also be remembered that I am not an actuary, but rather a financial professional who volunteers his service to the State. My intent and hope in writing this note is to simply outline some pros and cons of various policy and investment options facing public pensions and how the actuarial assumptions fit into the mix.

The Role of Actuarial Assumptions:

Actuarial analysis attempts to compare the value of benefit liabilities that will be paid over many decades to the assets held by pension plans today. The value of the plan’s liabilities is dependent on the interest rate at which the liabilities are discounted, or, conversely, the rate at which assets can be expected to appreciate. Discounting is a financial term whereby a future asset or liability is equated to a value in today’s terms by taking into account the time value of money. For example, \$100 today equates to \$105 one year from now, if the \$100 is invested at 5% for one year. In other words, an investor who can earn 5% would be indifferent between receiving \$100 today or \$105 one year from now. For public pension plans, standard actuarial accounting discounts liabilities at the rate which is expected to be generated by the portfolio of the assets it holds. The discount value of the plan liabilities is then compared with the value of assets to calculate the plans’ funding ratio².

The source of concern which prompted this note deals with whether the 8.25% return assumption in place at the beginning of 2012 – and indeed, well prior to January of 2010, is realistic in the current environment of exceptionally low official and market interest rates³. It seems to be a practical question to ask, especially since changes in the rate *could* have dramatic effects on the pension plan.

Lowering the rate has the effect of increasing measured liabilities, and vice versa. In theory, the portfolio should shift assets to risks which match the new return assumptions. However, in reality, this is not how it works, and therefore a debate arises as to whether actuarial changes have any real impact on investment decisions by the pension fund at all; or whether they are merely illusionary. The reason is that invested assets do not change when return assumptions change. The portfolio is not being adjusted to higher or to lower risk assets, due to an actuary rate change. The SIC, for example, does not concern itself

² The funding ratio is the value of the assets divided by the value of the liabilities, while the unfunded liability is assets minus liabilities.

³ The risk free rate or Fed Fund Target is 0% to 0.25%. The 10 year Treasury Bond yield is 1.45%.

with the level of the discount rate, because its main portfolio concern (as a fiduciary), is to maximize return per unit of risk. From an investment perspective, any asset or allocation change that moves the portfolio “up and to the left” on the efficient frontier is desirable⁴.

It may be that the practical implication of any change in the assumed rate of return is that it implies the need for a greater contribution to the plan either from plan participants or from governments, which is why the discussion of appropriate discount rates and return assumptions has generated political controversy in recent years.

The financial health of state pension plans has also come under increased scrutiny in recent years due to widespread deterioration in funding levels. Shortfalls were dramatically impacted by the 2008 financial markets crisis, but government funding holidays and benefit increases passed during the prosperous period of the 1990’s also contributed. Historic investment gains of the late 1990’s masked structural weaknesses in government pension systems. Numerous states are enacting or trying to enact pension reform to try to correct the perilous position that significant underfunding creates, but in many cases, attempts at reform are controversial, and are understandably being opposed by representatives of current and future plan beneficiaries.

Benefit amounts are typically calculated by a formula using the number of years of employment and final compensation. In theory, the state invests money to *ensure* that the pension promises can be kept. If the assets do not grow to match obligations, then in many states taxpayers are obligated to make up the difference.

It may be interesting to point out that there exists some break-even interest rate (at every point in time) where the discount rate would result in a funding ratio at 100%. A significantly underfunded pension becomes 100% funded at some higher assumed rate level. This hypothetical exercise is useful because it emphasizes the premise behind concerns that the current rate is thought to be unrealistically high. Questioning the level of the discount rate’s appropriateness opens the entire topic up to a set of wider discussions. Before heading in this direction, it would be helpful to mention some differences between defined-benefit and defined-contribution plans before moving toward a brief comment on the actuary process and the factors that enter into actuarial decision making.

Too frequently, governments have offered greater benefits than are prudently affordable. Poor long-run financial planning has compounded mistakes. Governments reacted to short-term performance gains and did not always take into account long-run averages of investment returns, leaving them susceptible to contribution payment volatility and shortfalls in funding ratios. By not saving during prolific years, governments placed themselves in a difficult position during the lean years. If a pension assumes a high rate of return on its investments or understates the full actuarial cost of benefits, the taxpayers

⁴ The efficient frontier is a concept in modern portfolio theory introduced by Harry Markowitz. It plots the best possible expected level of return per level of risk. “Up and to the left” means higher return and lower risk at the portfolio level.

are exposed to significantly greater risk; assuming of course that the benefits are indeed guaranteed⁵.

Defined-benefit pensions were originally a well-intentioned effort to provide stable, post-retirement income through a “paycheck for life”, but have now become such a growing part of state budgets that their ability to remain solvent has been called into question. Governments are therefore beginning to ask beneficiaries to renegotiate prior promises under the argument that “something is better than nothing”.

Accumulating liabilities are a real threat. The savings and loan industry devastated the US economy and saddled taxpayers with a \$125 billion bill. The National Bureau of Economic Research (NBER) and the Pew Research Center, among others, believes that today’s public pensions may be underfunded by more than 10 to 25 times that amount (\$1.5 to 3 trillion)⁶.

There have been increased calls to convert plans from defined-benefit pension plans to defined-contribution (DC) plans, similar to the significant trend in the private sector over the last decade. A defined-contribution plan spells out the level of contribution employers and employees will make to the retirement system – not the level of benefits they will receive at retirement. The level of benefits the employee ultimately receives upon retirement will depend on the performance of the investment of their contributions, as well as the level of participation. Employees bear the risk of their investment, but also get to maintain control over these investments. From the governments’ point of view, a DC plan provides some budgeting and planning stability too, since contributions levels are known in advance and do not change much from year to year. Such plans also reduce potential taxpayer liability considerably.

The Setting of Rate of Return Assumptions

Professional actuaries use a set of guidelines called the “Actuary Standard of Practice” (ASOP) when setting the investment return assumption (among other assumptions). For the investment return assumption, recommendations include: current yields on government and corporate bonds; expected rates of inflation and return for each asset class; historical investment data; and the plan’s historical investment performance.

The ASOP goes on to say that the actuary may also consider historical standard deviations, correlation, and other statistical measures related to historical returns of each asset class and to inflation. It also recommends “other factors to be considered” including: the plan’s investment policy – asset allocation, risk tolerance, target allocations, etc; expected volatility of the portfolio; performance of managers investing the assets; and projected timing and volatility of cash flows. Demographic issues also affect long run assumptions and the pension plan’s overall financial health; and include issues such as changing mortality rates and early retirement.

⁵ State courts across the country are opining on whether promised benefits can be reduced, renegotiated, or taken away.

⁶ <http://www.nber.org/digest/nov08/w14343.html>

The ASOP recommends using a range when setting the return assumption, “because no one knows what the future holds with respect to economic and other contingencies, the best an actuary can do is to use professional judgment to estimate possible future economic outcomes based on past experience and futures expectations, and to select assumptions based upon that application of professional judgment. Therefore, an actuary’s best-estimate assumption is generally represented by a range rather than one specific assumption. The actuary should determine the best estimate range for each economic assumption and select a specific point from within that range. In some instances, the actuary may present alternative results and select different points with the best estimate range”⁷.

Economists would argue that the discount rate applied to the future benefits should have nothing to do with how the plan’s assets are invested; but rather, the discount rate should be defined by the riskiness of the liabilities. If the risk were transferred to an insurance company, then this is how the insurance company would evaluate the risk. If the benefits are considered guaranteed, unchangeable and non-negotiable, one argument is that the assets backing the future liabilities should be only invested in risk-free assets. As a practical matter, there are at least two problems with this approach: first, the rate of return on truly risk free assets today is near zero, meaning that beneficiaries would then give up significant potential for asset appreciation, potentially for a very modest amount of incremental risk protection; and second, it is hard to find assets that are indeed risk free. Fixed income instruments in today’s extreme-low interest rate environment are subject both to valuation risk in the event of a rise in interest rates and inflation risk in a “hold to maturity” scenario. Even U.S. government securities were downgraded from the highest “AAA” rated category by the rating agency Standard & Poors in the summer of 2011.

For example, most beneficiary groups would not have demanded that assets get placed strictly in U.S. Treasuries during the stellar return years of the 1990’s. Yet faulty structures are exposed during difficult times. It could be argued that truly, guaranteed benefits should only be discounted (and invested) at the rate that the markets pay for guaranteed investments, i.e., US Treasury securities⁸. Yet the returns on those securities are such that virtually every public pension plan in the United States would require massive increases in both beneficiary and sponsor (i.e., state and local government) contributions if the entire portfolio were to be composed of Treasuries. As a result, virtually no public plan in the United States (and indeed, few if any, in the world) has chosen to confine its entire portfolio only to “risk free” investments in U.S. Treasury securities, which, in actuality, are not entirely risk free. If they did confine their investments to Treasuries, the risk to public pension plans in the United States would be substantial – but rather than investment risk, the greatest risk would be the political risk that the system would not tolerate adequate contributions from either employees or plan sponsors and thus the pension systems would not be able to meet their obligations in the future.

⁷ http://www.actuarialstandardsboard.org/pdf/asops/asop27revision_exposure_2011.pdf.

⁸ A zero coupon 25-year note yields approximately 2.25%

This tension between theory and practice has existed for many decades. And indeed, resetting all US public-sector pension's discount rate to even a rate as high as 2.25% (well above the rate on 10-year Treasury bonds today) would be nearly impossible now, in part because it would increase aggregated US State and Municipal underfunded liabilities to nearly \$4 trillion; a number which amounts to nearly 30% of the GDP of the United States⁹. Using a risk-free discount rate offers a point of reference, but as a practical matter it is unlikely to be the correct rate for the State of New Jersey to adopt. All other pension systems across the country and around the world do not invest their entire portfolios in riskless assets precisely because the benefits to beneficiaries of a more diversified and higher returning portfolio have been found in every case to outweigh the costs to beneficiaries in terms of the incremental risk of default or loss in an appropriately constructed diversified portfolio.

The whole point behind looking at this exercise is to make it clear that the value of the liability is distinct from the manner in which it is funded. Market valuation of liabilities does not make assumptions about how the pension assets are invested, precisely because the investment of the assets does not affect the value of the liability. Let's consider an example. \$1 million is due in 20 years. Using an 8% discount rate, the plan would be fully funded under actuarial accounting rules if \$214,548 is invested today. However, if a lower-risk return assumption of, say, 4% were to be used¹⁰ (and some would argue this is close to "risk free"), the investment needed to be invested today (i.e., the value necessary to meet the liability) would then rise to \$456,386¹¹. In this example, the pension must contribute over twice as much today to be sufficiently considered truly fully-funded.

One trouble that arises is that any investments with expected returns in excess of risk-free rates implies that the value of the portfolio after 20 years will most assuredly not equal \$1 million (using the example above), but rather some amount higher or lower than the desired amount. In fact, any plan has a less than 50% chance of being able to meet its obligations if it achieves an average return over the period that is exactly equal to the discount rate¹².

The example above partially explains why actuaries take exceptionally long time frames into account for their analysis. Using a discount rate that only looks at today's current yield on Treasury securities is misguided not only because it may fail to optimize the balance between the benefits and costs of such an investment policy, but also because it depends on the assumption that this rate will be the average risk free return over the period.

Conclusion:

⁹ A zero coupon 25 year rate was used for illustrative purposes. 25 years is near the weighted average term of the liabilities.

¹⁰ 4% is close to the risk free rate average of the last 15 years.

¹¹ A different form of this example was used in a paper by the American Enterprise Institute

¹² This is due to skewness of stock returns – causing the mean return to exceed the median return.

The major market losses in 2008 exposed inherent structural weakness in the portfolios of many public pension plans that had previously been masked by investment gains. Governmental failure to consistently fund pensions with annual contributions in many states merely compounded the shortfalls once market performance fell below trend. These poor policy decisions – raising benefits and raiding pension balances when returns were above normal -- are at the heart of the current crisis. They should serve as a reminder that the management of public pension plans is a long-term exercise that should be based on long-term assumptions.

How to plug the underfunding deficit in many public pension plans is a topic of widespread political and market debate. The NJSIC does not, and should not, involve itself in determining the source of funding, the actuarial assumptions used, or the state's funding obligations and calculations, nor should those factors have any impact of how the Council's investment oversight mandate is fulfilled. The NJSIC should remain focused strictly on maximizing asset value over time through its fiduciary responsibility to maximize return per unit of risk using the best possible governance practices. The NJSIC should continue to honor its specific mandate "to formulate policies governing the investment of the funds and to consult with the Director with respect to the work of the Division"¹³.

¹³ <http://www.nj.gov/treasury/doinvest/sicreg.shtml>