Investment Risk

Investment risk is a complex topic that has been the subject of extensive academic research by some very intelligent people. We have tried to distill the bits of this field that are relevant to our discussion into the following few pages, but if you wish to understand more of the theoretical underpinnings, the staff can recommend additional texts.

Non-Systematic Investment Risk

Non-systematic investment risk is the risk that a single security will drop in value. For example, consider some former employees of Enron who put most of their 401(k) assets into company stock. They were taking on significant non-systematic risk by investing in a single security rather than in a broad portfolio of stocks and bonds.

Non-systematic risk can be easily eliminated at little cost by holding a diversified portfolio. Such diversified portfolios are commonly held by defined benefit pension trusts and are also generally available to defined contribution investors through a diversified offering of mutual funds. The only significant source of non-systematic risk that remains in the pension world is company stock. The use of company stock in 401(k) plans has declined since the Enron debacle and is irrelevant to our discussion anyway since state and local governments obviously do not issue stock.

Systematic Investment Risk

As many investors saw in 2008, a lot of risk remains in a diversified portfolio. This remaining risk is called systematic or market risk. It is the risk that the broad stock and risky bond markets all decline in value at the same time. Because this remaining risk is so significant, the Commission will need to address which party should bear it.

Asset Classes

To simplify the discussion, the Commission could consider only two types of assets: risky and non-risky. While questions of proper asset allocation between domestic and international, small cap and large cap, active and passive management, and so on are important, they are probably too detailed for the broad discussion of who should bear systematic risk.

Risky assets would generally include:

- Stocks or public equity
- Corporate bonds, other than perhaps those with the highest possible credit ratings
- Mortgage bonds
- Alternatives (private equity and hedge funds)
- Real estate
- Commodities

Non-risky assets would generally include:

- Stable value or money market funds
- U.S. Treasury bonds, including Treasury Inflation Protected Securities (TIPS)[1]

[1] For more info on TIPS, see http://www.treasurydirect.gov/instit/marketables/tips/tips.htm

Investors expect to be rewarded for taking on more systematic risk. Thus, the portion of assets invested in risky assets is expected to earn a higher average return than the portion invested in non-risky assets. Estimates of this risk-premium for common equity (stocks) usually range from 1% to 4%.[2] Over time, this premium can make an enormous difference in spending power. For someone working a 45 year career, a 3% risk premium could double the replacement rate (with a constant savings rate) or cut the required savings rate in half (while keeping the replacement rate constant). Thus, under certain conditions, one or more of the parties involved in a public pension plan (employees, taxpayers, and users of government services) may wish to bear systematic investment risk in order to get these higher returns.

Conditions for Bearing Systematic Risk

We propose several conditions that should apply before one of the parties bears the systematic investment risk:

1. The party should be aware that they are taking the risk if it is material relative to their income and/or assets.
2. The party should have a process to determine the right amount of risk to take, i.e. the portion to invest in non-risky assets and the portion to invest in risky assets. Note that just because one party bears whatever risks are taken does not mean they need to invest 100% in risky assets.
3. The party should have a process to make adjustments if returns are worse than expected. Risk obviously entails the possibility of bad events. If these bad events occur, the party bearing the risk should be prepared to accept the best combination of adjustments, rather than pretending that everything is still ok.
4. The party that takes the risk should get the proper reward.

Defined Benefit (DB) and Defined Contribution (DC) Plans

In a traditional DC plan, the employee bears the investment risk. If they invest in assets that decline in value, they will have to make a combination of the following adjustments:

a. Plan to spend less in retirement
b. Plan to work longer, and
c. Spend less now (save more)

In a traditional DB plan the employer often bears the systematic investment risk in the sense that employer contributions will increase if the system experiences investment losses. However, this can be a gray area. For example, if employer contribution increases cause the employer to give smaller pay increases to employees than they otherwise would have, the employee is bearing some of the risk.

While these descriptions of investment risk hold true for traditional DB and DC designs, the Commission should note that it is quite easy to design DB or DC plans that do not fit the descriptions above. One can design a DB plan in which employees take the investment risk.

[2] See http://www.cfapubs.org/doi/pdf/10.2470/rflr.v2.n1.4477 for a good overview of the literature on this topic.

One can design a DC plan in which employers take the investment risk. One can also design either type of plan in which neither party takes investment risk.

Determining the Right Amount of Risk to Take

As added background on criterion two, here are two factors that might determine the optimal level of risk:

- Risk aversion. In economics, the primary reason for risk aversion is that an individual often suffers more from a given loss than they benefit from a gain of the same size. For example, if you have little income, then a reduction of $500 a month might mean that you have to go hungry or cannot stay warm in the winter. However, an increase of $500 a month might just allow you to go to the movies or go out to eat or do other things that are fun, but by no means essential. Thus, someone planning for retirement should probably consider what they would give up if they suffered an extreme loss in the stock market and compare that to what else they would buy if they received an extreme gain. A taxpayer/service user could do a similar calculation.
- Other investments with fixed risk. If an individual has other financial assets, for example an IRA or brokerage account, he or she can easily adjust the amount of risk in those other accounts to offset any risk in the pension that is above or below the desired amount. However, the investor may have significant non-financial assets whose risk cannot be easily adjusted. The three primary examples are housing, human capital, and social insurance. For a variety of reasons, it may make more sense to own your house than rent. Especially before the last decade, housing was a low risk investment that might have justified taking more risk in a retirement plan. Particularly for young people, one of the most valuable assets they have is their human capital, i.e. the present value of their future wages. This investment may be relatively safe and this is the primary reason that young participants are usually encouraged to take more risk in a 401(k) plan. Finally, Social Security offers a fairly secure benefit, certainly for workers who are currently close to retirement. The presence of Social Security allows people to take more risk in their pension plan than they would without it.

Reasons You Might not Earn Full Reward of Taking Risks

As added background on criterion 4, there are several reasons that parties taking risk through a pension plan might not be properly rewarded:

- Taxes. The current federal tax structure encourages taking equity risk outside of pension plans. Capital gains and dividends are taxed at a top rate of only 15%, while interest on safe bonds is taxed at personal rates that can reach 35%. If an individual can invest in both tax-deferred accounts and taxable accounts, the individual earns the highest after-tax return by putting bonds in the tax-deferred account and stocks in the taxable account. This also applies for taxpayers/service users indirectly "invested" in a defined benefit plan.
- Option Costs. If excess returns are given away to one party while shortfalls are borne by a different party, you may have created an uncompensated option cost. In some pension plans the party receiving the excess returns is the employees and the party bearing the shortfalls is the employer. Financial professionals would describe this arrangement as the

employer granting a call option to the employees and retirees. A call option is an investment that pays 100% of the return if returns are above a certain level and yet suffers no losses if returns are less. Since the payoffs can only be positive, this option has a value and investors pay good money to enter into these arrangements in the financial markets. If employees compensate the employer for this option by accepting lower salaries or benefit levels (specifically because of the option, not because of the general level of benefits), then the employer might be fairly compensated. For more on options, see http://en.wikipedia.org/wiki/Call_option.

- Overestimating Amount of Risk. One party may have a very different perception of the amount of risk involved. For example, some employees may view pension payments from the NC systems as somewhat risky, when in reality the combination of a large pool of assets, a AAA credit rating, and a solid legal obligation probably make the payments as safe as US Treasury debt. However, if employees still perceive a risk, they may require better benefits to compensate for that misperceived risk.
- Underestimating the Value of a Risk-Free Benefit. In setting contribution rates for defined benefit pension plans, it is common actuarial practice to use an expected return on plan assets to discount future payments. If some of the plan is invested in risky assets, this expected return will generally be higher than the risk-free interest rate. For example, the average public fund uses an interest rate of 8% and the yield on 30-year US Treasuries in late 2009 was around 4.5%. In determining the value of their benefits, employees may either directly use the contribution rates from the valuation report or they may use the interest rates from the valuation report to discount payments regardless of risk. In this case, the employer can eliminate its risk while not reducing the employee's perceived value simply by making the payments sensitive to investment returns while keeping the expected average payment the same.

Background on Equity Returns vs. Risk

On average, stock returns have beaten U.S. Treasury Bond returns, sometimes by substantial margins. For example, someone who invested $100 in the S&P 500 (or its predecessor) in 1933 would have $8,325 by 1969, while someone who invested in long-term US Treasuries at the same time would have only $231. However, there are also long periods of time when bond returns beat stock returns. The following article provides an excellent historical perspective on US markets:

http://www.indexuniverse.com/publications/journalofindexes/joi-articles/5710-bonds-why-bother.html?Itemid=11

As noted in the article, the 40 years to early 2009 were one of the periods of outperformance by bonds. In addition, the U.S. experience in the 20th Century (often called the American Century with good reason) may not be representative of the broader world or expected U.S. investment performance in the future. One obvious example from another county is Japan, where the Nikkei index peaked at roughly 39,000 in 1989. In November, 2009, it stood at around 10,000.