

Coming Full Circle

A Pension Risk Primer

MAYBE MY FATHER'S GENERATION OF ACTUARIES WAS RIGHT. Maybe pension assets should be invested in high-quality, fixed-income investments with a duration the same as or similar to the pension liability. Maybe then pension contributions would be predictable and affordable, as they were originally intended. Maybe then plan sponsors wouldn't replace their pension plans with defined contribution plans because defined contribution plans are allegedly "cheaper." (Any actuary reading this article knows that given similar investment experience, "cheaper" is a euphemism for "lower benefits.")

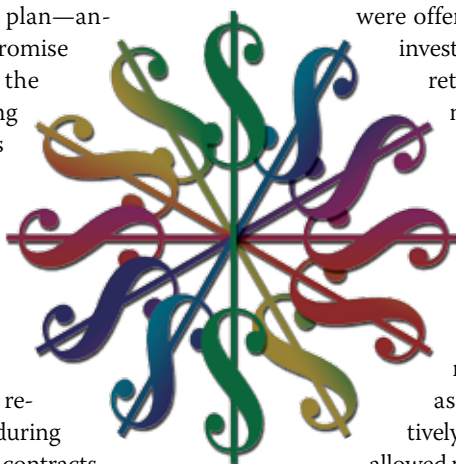
The concept of a defined benefit plan—annual funding to secure a long-term promise to pay—isn't inherently flawed. To the contrary, the current trend of freezing or terminating pension plans results from a mismatch between the pension liability and assets, set in a legal environment that no longer allows effective smoothing of short-term economic fluctuations.

Historical Background

Pension investment vehicles and their relationship to pension benefits evolved during the 20th century, from group annuity contracts to deposit administration contracts to immediate participation guarantee contracts.

Pension investment vehicles began with a very close linkage to the pension benefits, and this linkage weakened with the introduction of every new investment vehicle that traded some cost stability for lower overall cost. The lower cost was achieved by lower insurer guarantees and thus lower risk charges, as well as exposure to investments with higher returns. Plan sponsors migrated to these new investment vehicles because of the lower overall costs, while the potential for volatile costs wasn't immediately apparent. The legal framework for determining contributions for much of the 20th century allowed pension costs to be smoothed over long periods, and as long as that remained true, most plan sponsors chose lower costs over more stable costs.

Trust funds held by non-insurance trustees were the final stage of pension investment evolution, and became popular with plan sponsors who wanted more flexibility and access to a broader array of investments than insurers



were offering. To the extent that these other investment opportunities provided greater returns than insurance company investments and that volatile returns and the effect on contributions could be smoothed, plan costs decreased even further. The linkage between the pension liability and assets became minimal.

Beginning in 1976 with the enactment of the Employee Retirement Income Security Act (ERISA), asset-smoothing methods and relatively long gain/loss amortization periods allowed plan sponsors to tolerate deep market troughs without substantially increasing their contributions. Amendments to ERISA significantly changed the legal environment for calculating required contributions.

After these amendments, investment losses and decreasing long-term interest rates required large contributions over a short time frame. Most plan sponsors, however, didn't change their philosophy of investing pension assets, and they discovered the implications of reducing the linkage between pension investments and benefits.

With the enactment of the Pension Protection Act of 2006, it's clear that the legal environment for calculating required contributions won't allow a return to the early days of ERISA. Perhaps it's time to revert to the early days of pension trust investment.

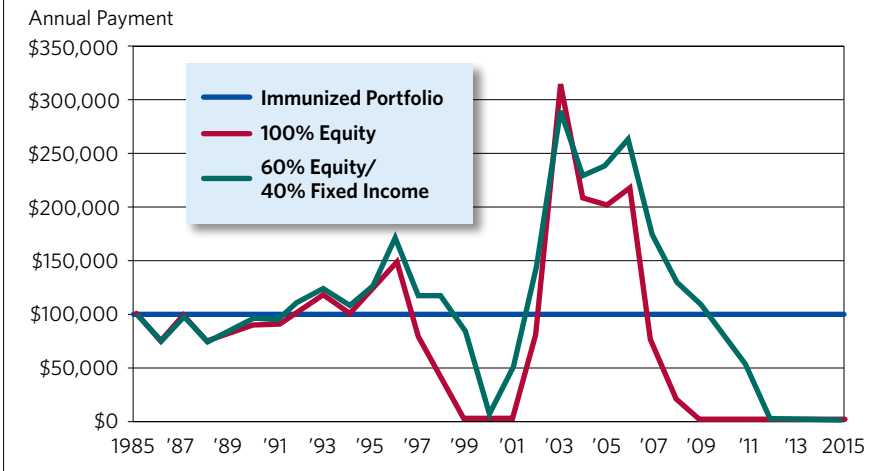
An Analogy

Suppose the management of the funding and investment of home mortgages were similar to that of pension benefits. (In this analogy, the homeowner is the plan sponsor, the participants are the lender, and the Pension Benefit Guaranty Corp. guarantees the mortgage to the lender.) People might be purchasing their homes under the following framework:

- ▶ The homeowner (plan sponsor) would pay the lender (PBGC) a lump sum at the end of the mortgage term, 30

ROBERT J. RIETZ is a director with Deloitte Consulting LLP in Detroit; ROBERT O. BACHER is a manager in the same office.

CHART 1—Annual Payment



years, in this example.

► The homeowner would make payments to a trust and be able to direct the investments. For simplicity, this example uses annual payments, with the first payment due at closing.

► The homeowner’s minimum funding

mortgage account (MFMA) would equal the excess of the actual payments made over the annually recalculated amortization amount. The homeowner could use the credit balance in the MFMA to reduce the amount of any year’s payment.

► The mortgage and the trust would be

valued every year, and the payment would be recalculated according to then-current interest rates, with the maturity period decreasing every year. Contribution holidays could occur if assets exceeded the present value of the balloon payment.

► The homeowner couldn’t pay off the mortgage before the scheduled balloon payment date unless he sold the house (terminated the pension plan).

► The guarantor could foreclose the mortgage, even if the homeowner maintained a positive MFMA, as long as the present value (at then-current interest rates) of the balloon payment exceeded the trust assets by some amount. The guarantor would place a lien on the homeowner’s other assets for the unfunded amount.

► The homeowner could receive any excess assets but only after the lender received the balloon payment at the mortgage’s maturity date.

Let’s consider a scenario comparable to a group annuity contract, using a \$1 million mortgage amount. Beginning in 1985, the homeowner invests each year’s payment in a high-quality, zero-coupon bond that matures at the balloon payment date. For purposes of this example, we’re assuming that the homeowner has exceptional credit and can invest at the same rate as the mortgage rate. Despite any yearly fluctuation in interest rates, the unfunded amount at any point will equal the familiar amortization schedule, and each year’s payment remains constant at \$97,334. The portfolio is immunized: The liability and the assets are perfectly matched.

Now suppose that another prospective homeowner believes equities outperform fixed-income investments over long time frames and decides to invest each year’s payment in equities. For purposes of this example, we’ve used an index fund that tracks the S&P 500. Chart 1 compares the annual payment for each portfolio and also the annual payment of a mixed portfolio described later.

Chart 2 shows every year’s unfunded amount for each of the three portfolios if the homeowner began the mortgage in 1985. Several interesting results of the

What happens when the country’s top actuarial firm joins the world’s leading financial institution?

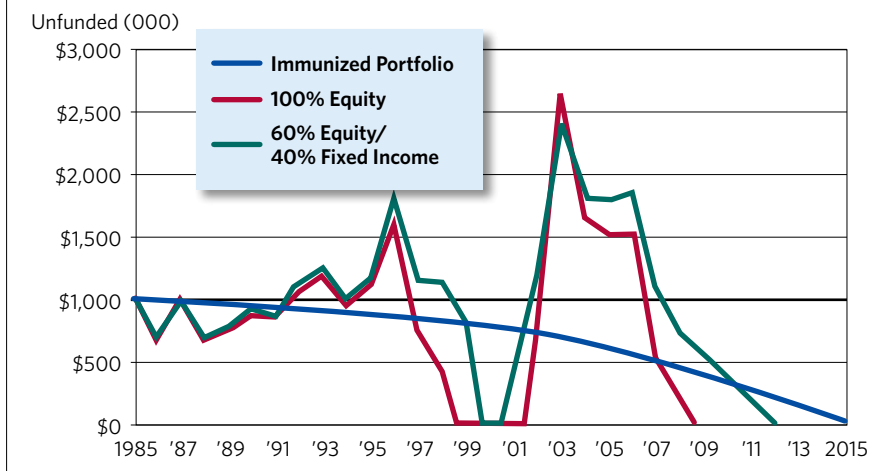
Introducing JPMorgan Compensation and Benefit Strategies.

The creativity, actuarial leadership and analytical prowess of CCA Strategies. The global reach and asset expertise of JPMorgan. The ingredients are unique—the result is profound. As JPMorgan actuaries, we are committed to generating leading ideas in benefits and compensation, and have the resources to put them into motion.

For more information, visit us at jpmorgan.com/cbs.



CHART 2—Unfunded



100 percent equity portfolio are apparent from Chart 2.

► The 1992 (and some later years) unfunded amount is greater than the original mortgage amount.

► The trust has more money in 1999 than the present value of the balloon payment. That is, the trust has a surplus, but the only way to enjoy the surplus is to sell the house. The homeowner enjoys a payment holiday.

► Only four years later, the 2003 unfunded is more than 2.5 times the original mortgage amount.

► Beginning in 2009, the trust returns to a surplus position.

The numerical data behind Chart 1 indicate that the total payments for the 100 percent equity portfolio are less than the total payments for the immunized portfolio. This isn't unexpected, since equities outperform fixed-income over long periods. However, the annual payment for the 100 percent equity portfolio ranges from zero to more than three times the payment for the immunized portfolio. These results occurred because the liability and the assets were badly mismatched.

The volatility of the unfunded and payment amounts could be acceptable for those homeowners who were willing to accept the risk, with the goal of lowering the overall payments required to fund the mortgage. These homeowners should

make that decision within the context of their entire household budget, after fully considering the probability and magnitude of future fluctuations.

A third prospective homeowner was aware that equities could fluctuate significantly and attempts to balance the trust by investing only 60 percent of each year's payment in equities and 40 percent in a fixed-income index fund whose duration is about five or six. Charts 1 and 2 show similar results for this portfolio as the 100 percent equity portfolio.

Analysis

Why did the hypothetical mortgage arrangement have widely volatile results for the 100 percent equity and the 60 percent equity/40 percent fixed-income trusts, when compared to the immunized trust? Was the mortgage design inherently flawed, or was it due to badly mismatched liability and investments?

The homeowner who invested each year's payment in high-quality, fixed-income investments that had the same maturity date as the mortgage had an annual payment that remained constant after each year's valuation, and the unfunded amount tracked the amortization schedule. These results occurred because the liability and the assets were perfectly matched.

Suppose that pension assets were invested in high-quality, fixed-income

investments with a duration the same as or similar to the pension liability. The mortgage analogy suggests that each year's required contribution would remain relatively predictable and the unfunded amount would approximately follow a traditional amortization schedule.

Admittedly, a portfolio of high-quality bonds is expected to provide lower returns than equities over a sufficiently long period. Alternatively, a relatively predictable pension contribution pattern and a less volatile unfunded amount can be achieved by using non-traditional investment products available today. These financial instruments offer returns that can often exceed the returns of a fully immunized portfolio. (This topic is beyond the scope of this essay.) Ultimately, the plan sponsor's objectives and risk profile should determine the investment strategy selected and should be continually monitored.

In 1976, the maximum deductible contribution amortized prior service over 10 years. Under the Pension Protection Act, the minimum prior service amortization period is seven years, nearly a complete turnaround from ERISA. Plan sponsors now operate under a legal framework that reinforced a very tight linkage between pension assets and liabilities. Yet relatively few plan sponsors have changed the 60 percent equity/40 percent fixed-income allocation they've maintained for 40 years.

While the possibility of a lower contribution might appeal to plan sponsors, they need to understand the probability and magnitude of the risks they're accepting. When doing so, plan sponsors should make that decision within the context of their entire business operations. ●

This commentary is solely the opinion of its authors. It does not express the official policy of the American Academy of Actuaries; nor does it necessarily reflect the opinions of the Academy's individual officers, members, or staff.