

Plan Design Approaches to Volatility Management in Retirement Plans

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Abstract: Volatility in pension fund investments creates significant problems for plan sponsors. The investment volatility can lead to unacceptable levels of contribution volatility and relatively wide swings in the plan's perceived funded status. This paper approaches the volatility problem from a plan design perspective by offering benefit plan designs that help reduce an employer/sponsor's exposure to volatility.

This paper is divided into two sections. The first section provides some basic information concerning volatility and how it affects pension plan funding and expensing decisions. In addition, the first section provides some illustrations as to how the volatility problem has been commonly handled. The information is provided in the first section as a means of setting the stage for the plan-design-based solutions to volatility management, which is the primary focus of the paper. The second section of the paper presents some plan-design-based methods for dealing with pension investment volatility.

1. Setting the Stage

Background

The concept behind an employer-sponsored defined-benefit pension plan is really quite simple. The employer, or the employer and the union working through a collective bargaining process, or a governmental employer working through the legislative process, agrees that the employer is to provide a certain level of retirement benefit. Historically, the factors affecting the chosen level of benefits have included an element of workforce management. The plan would be designed to help transition older, and presumably less productive, employees into retirement. This action would both free up promotional slots within the organization as well as provide for a workforce that would be as efficient as possible.

Once the slate of benefits was set, the funding process would consist of making periodic contributions to a separate trust fund that was specifically set up to provide the pension payments. In addition to receiving the contributions, the trust fund would receive investment income on the assets before they were needed to provide the benefits. Obviously, the greater the investment income that the assets would earn, the lower the contributions that would be required to fund the pension plan. The desire to maximize potential investment earnings has led many pension plan sponsors into adopting an investment strategy that has featured a relatively high exposure to equity investments. The reason for this policy is a natural consequence of the fact that over time equity investments have tended to provide a rate of return that is larger, on average, than the returns generated by fixed-income investments.

By having had equity exposure in the past, it is clear that plan sponsors have saved billions of dollars in contributions, all other factors being equal, over what they would have needed to have spent without having the equity exposure. Based on data in *Ibbotson Associates Stocks, Bonds, Bills and Inflation 2008 Classic Yearbook*, average returns for large company stocks for the 20-year period ending in 2007 were about 11.8 percent,

whereas average returns on long-term bonds were only about 8.8 percent. But this additional return has come with a price, and that price has been the volatility of both the required contribution levels and the current funding status of the plan due to the natural, and unavoidable, volatility in equity investments.

Contribution Volatility Management

Stock market returns will vary from year to year, sometimes significantly. For example, the Ibbotson data cited above show that for the year 2002 large company stock investments lost 22.1 percent, whereas for the year 1989 large company stock investments gained 31.5 percent. Assuming that the assets of the plan were approximately equal to the value of the benefit obligations of the plan before a large loss, the plan will appear to be underfunded after a significant market downturn. This appearance of underfunding creates a pressure on the plan sponsor to make larger contributions, perhaps at a time when making such increased contributions will put a strain on the plan sponsor's resources. The Pension Benefit Guaranty Corporation (PBGC), the Department of Labor, accounting regulatory bodies, and other such organizations all have an interest in seeing that a plan is funded sufficiently to assure the participants that actual promised benefits will be paid.

Even stellar market performance can create funding issues for a plan sponsor. Again, assuming that the assets of the plan are approximately equal to the value of the benefit obligations of the plan before a large gain, the plan will appear to be overfunded after a significant market upturn. This event might trigger a contribution holiday where the plan sponsor is not required to make, and might even be precluded from making, periodic pension contributions. While on the surface such a contribution holiday might appear to be a pleasant turn of events from the employer's perspective, all too often the plan sponsor gets used to the reduced contribution level, and restarting the contributions in the future may be difficult.

To help control contribution volatility, it has become common to adopt an actuarial value of assets for the purposes of setting the current year's contribution requirement. The goal behind using the actuarial asset value is to try to smooth out some of the normal (and expected) swings in stock market values. Hopefully, using the asset smoothing techniques will help maintain a consistent, and predictable, contribution level. By spreading the recognition of actual investment gains or losses that are different than anticipated returns over a period of time, the employer's contribution level becomes less volatile than it would be otherwise. A variety of different asset smoothing techniques have been used, and a summary of them is found in *The Pension Forum* for August 2001.

Delayed Recognition Strategies

Asset smoothing techniques as described above are an illustration of a specific class of plan funding strategies that can be referred to in general terms as delayed recognition

strategies. The concept behind any delayed recognition strategy is to take a particular measured dynamic of pension funding, and provide for a smoothed payment pattern, to help lessen the plan's volatility concerns.

As an example on the benefit side, consider the case where a plan is amended to provide a specific one-time improvement such as a cost-of-living increase for retirees. When such a benefit improvement is adopted, one approach might be to pay for the improvement all at once. Clearly, this approach creates a huge "spike" in the contribution requirements, which could serve as a deterrent to the adoption of such improvements.

To deal with this problem, it has been common to amortize the cost of such improvements over a fixed period of years, in much the same way that a real estate mortgage may be used to pay for a house. Clearly, this approach smoothes the plan's costs, but does so by delaying the recognition of incurred liabilities. In addition to plan improvements, the delayed recognition approach could be applied with respect to any plan experience that is different from plan assumptions. The costs associated with improved mortality experience, reduced turnover experience, or increased utilization of early retirement provisions could all be amortized rather than being paid for at the time the liability is actually incurred. This reduces volatility, but at the expense of delayed recognition of a true plan liability. Thus, this approach leads to the possibility of plan underfunding as noted below.

Problems with Asset Smoothing or Amortization as a Volatility Control Mechanism

The philosophy behind using asset smoothing techniques is that somehow years of high stock returns will be balanced out by years of low stock returns, and that the overall market return will be somewhat near its historical average. But the market is dependent upon the hopes and dreams of investors, and these hopes and dreams may change over time. Just because stocks have averaged a 10 percent return over the past 85 years does not guarantee that they will generate this level of return in the future. Plan sponsors who employ asset smoothing techniques that defer the recognition of actual market returns that are different than what had been assumed may be doing so under the assumption that these differences will be offset by different market behavior in the future. Or, perhaps, they may deem the unfavorable experience as a non-recurring event, and, as such, they do not need to provide a change in current funding strategy. But in either event if the market has changed in some material way, the anticipated investment returns may not emerge, and the use of the asset smoothing technique may only cause the plan's funded status to recover more slowly than if a more immediate recognition of the funding problems were employed.

The same general concern can be expressed for any of the amortization techniques. When the true incurred cost for a plan is not recognized immediately, there is the potential for a future asset shortfall. There is a legitimate concern that if the obligated funding pattern is not met, participants' benefits might not be paid.

For this reason, over the last couple of decades it has become more common to require some pension plans to “mark to market.” In other words, the funding status of the plan is to be measured using “market-based” values for liabilities, and the actual market value of the plan’s assets. Under these circumstances, a plan with a high level of equity exposure might appear to be reasonably well-funded under the assumption that equity returns match their historic levels, but the plan will appear to be underfunded if the plan’s assets are shown at market values, while the plan’s liabilities are shown at “settlement” levels—levels that could be met with fixed income obligations based on lower (and sometimes significantly lower) rates of return than those that have been historically achieved by equity investments.

The impact of these “mark to market” requirements can be huge. For a plan with a healthy mix of retirees and active workers, it would not be uncommon to find the marked-to-market benefit obligation to be perhaps 50 percent higher than the level of the obligation if the obligation were measured under the assumption that the plan’s equity investments will generate investment income at historic levels.

Volatility Management Using Investment Strategy

The swings in mark-to-market liability measures have prompted new theories in pension investing. These theories are sometimes referred to as liability-driven investing. The basic premise is quite understandable. These theories call for investments that support pension payouts to be placed in fixed income securities that are specifically selected for their ability to generate income that matches the actual anticipated benefit payout pattern.

Once such a fixed income portfolio is in place, the pension plan becomes somewhat immunized from market swings due to changes in the overall interest rate climate. If interest rates fall, the marked-to-market value of the plan’s benefit obligations will increase. But so will the market value of the plan’s fixed income investment portfolio. Using a well-designed investment strategy, a plan that was deemed to be fully funded in one investment climate will likely be deemed to be fully invested in any other. The value of the plan’s assets and the plan’s benefit obligations will tend to move in a lock-step pattern.

But liability-driven investing comes at a significant cost. If one believes that over the long run equity investments will outperform fixed income investments, then the plan sponsor who adopts a liability-driven investment strategy loses out on the potential additional gain from equity investments. As an aside, it is interesting to note that many of the target-date investment strategies that are being marketed to 401(k) plans feature an equity exposure component of 90 percent or more for the youngest 401(k) plan participants. Clearly, the advocates for the target-date strategies believe that in the long run equity investments will achieve a higher rate of return than fixed income investments.

Depending upon plan demographics, it is fairly easy to see situations where the overall contribution requirements for a plan using the liability-driven investment approach are 20 to 30 percent larger than they would have been had the plan used a more conventional

asset mix. This conclusion is, of course, based on the assumption that stock investments will significantly outperform fixed income investments in the future just as they have done in the past. This is an assumption that may or may not turn out to be true.

2. Benefit Design Strategies

All of the above subsections have been background for the balance of this paper. This section will begin the primary focus of this paper, that being plan design strategies that will help a plan sponsor manage plan volatility. Three different design-based strategies will be presented: a defined-contribution approach, a variable annuity unit approach and a floor plan approach. Actually, one of these design approaches has been widely implemented over the past two decades. That strategy has been to convert the primary method for providing retirement benefits from a defined-benefit plan design to a defined-contribution plan design.

2.1 Defined-Contribution Approach to Volatility Management

The massive conversion from defined-benefit plans to 401(k) plans has completely eliminated the plan-sponsors' volatility problems. Once the conversion occurs, the contribution levels become fixed and relatively stable and predictable. Certainly, this aspect of plan design has been a key driver in the conversion process. But this conversion process merely transfers the volatility problem from the employer to the employee participant.

On the surface it does not seem to matter which form of plan, either defined contribution or defined benefit, is used to provide benefits. If the employer is willing to fund the plan at a fixed level, say 5 percent of employee pay, then the average participant should be just as well off with one type of plan as the other. The trust fund still earns investment income, and the plan still provides retirement benefits. Assuming the employee handles the volatility problem well, the overall benefit levels between the two types of plans should not be materially different.

Defined-Contribution Design Concerns

But the transfer of the volatility problem to the employee and other factors combine to create a situation where defined-contribution plans often provide significantly smaller retirement benefits than their defined-benefit counterparts that have the same employer cost. The fact that 401(k) plans have fallen well short of delivering the benefits expected by participants has now been well documented by the Boston College Center for Retirement Research.¹ When 401(k) plans fall short on delivering promised benefits, the workforce management aspect of plan design disappears. Employees who cannot afford

¹ "401(k) Plans Are Still Coming Up Short." Center for Retirement Research at Boston College, March 2006, Number 43.

to retire will want to continue working regardless of the employer's desire to open up promotional channels or hire more productive workers.

One key problem with defined-contribution approaches is having valuable contributions that were designed to provide retirement benefits be used for other purposes or fall short of meeting their necessary retirement purposes for other reasons. For example, it is not uncommon for participants who may change jobs to cash in their current defined-contribution accounts and use the money to meet non-retirement needs. Once the money has been spent, it will not be available to provide retirement benefits.

But even if employees who terminate employment were legally blocked from spending their account values for non-retirement purposes, two other elements of defined-contribution plans play a significant role in their potential financial efficiency: investment return and mortality risk.

Investment Return in 401(k) Plans

It has become almost universal to allow 401(k) plan participants to direct their own investments. But the decision to grant this discretion to participants transfers the investment responsibility from the full-time professional money managers who typically make investment decisions for a defined-benefit plan to "part-time" managers, the employee participants who may have a very limited understanding of their responsibilities.

It seems only natural that the full-time professional money managers should outperform the part-time participant counterparts. In fact, Watson Wyatt (now Towers Watson) studied this particular question by gathering actual 401(k) and defined-benefit data from the Department of Labor Form 5500 filings. The data showed that over a 17-year period, 1990 to 2006, the defined-benefit plans outperformed the 401(k) plans by about 1.0 percent per year. The average 401(k) plan return (geometric mean) was 8.2 percent and the average defined-benefit plan return (geometric mean) was 9.2 percent. Keep in mind that this is not just a sampling of data; it is the actual full database as reported by the Department of Labor. The data just confirm what would reasonably be expected; that participant investors are likely to underperform their professional counterparts.

While a 1.0 percent per year shortfall may not seem like much, over a reasonable career of 401(k) saving this level of shortfall could reduce a projected account balance that might have been 2.0 years of preretirement pay at age 65, to an account balance of only 1.7 years of preretirement pay.

The Mortality Risk

Another item of concern for defined-contribution plans comes from the necessity of an employee to fund his or her own mortality risk. In a defined-benefit plan, those participants who happen to die sooner than assumed release reserves to fund the benefits of those who happen to live longer than assumed. This dynamic does not occur in a

defined-contribution plan, and each participant is effectively required to fund his or her own possibility of living to an age of 95 or more. An early death will create an inheritance benefit for the children or other beneficiary. This is a situation that does not occur with a defined-benefit plan.

When this need to “overfund” in order to cover the mortality risk is combined with the investment return problem cited above, the combined impact is quite high. In a defined-benefit plan, a 5 percent employer contribution might be sufficient to support a benefit of 21 percent of final pay. In a defined-contribution plan, after consideration for the two concerns described above, the same 5 percent employer contribution might provide an annuity benefit of only about 12 percent of pay.² As noted above, the fact that 401(k) plans have fallen short of expectation is now well-documented. The above points only highlight some potential reasons for the shortfall.

2.2 Variable Annuity Unit Approach to Volatility Management

As seen so far, all common approaches to volatility management have drawbacks. Using an asset smoothing technique could cause the plan to appear underfunded in certain situations when mark-to-market accounting is required, which could create a need for additional PBGC premiums or other costs. Altering an investment strategy to reflect more fixed income investment and less equity investment means that the plan sponsor might need to make larger contributions than would otherwise be required, assuming that stock market returns continue to outpace fixed income returns. Converting from a defined-benefit plan to a defined-contribution plan completely solves the volatility problem from a plan sponsor perspective, but the amount of retirement benefit that is supportable by a given level of plan sponsor contribution is in general significantly reduced.

All of the above problems raise the question: Might there be a better way to manage an employer’s contribution volatility without incurring such a negative hit to the level of retirement benefit that can be purchased with each contribution dollar? The answer is yes, and one solution comes from revisiting a benefit design that existed over 40 years ago, but went out of favor. That benefit design is a defined-benefit plan with a variable annuity feature.

Variable Annuity Plan Designs

Occasionally, during the 1960s and 1970s, some plan sponsors offered a defined-benefit pension plan that had a variable annuity feature. Instead of earning fixed dollar benefit amounts, the participants would earn benefit units. The monthly payment made during retirement would then be the accumulated benefit units, multiplied by the current unit

² These are elementary illustrations. The defined-benefit results reflect an assumed pay rate growth of 4 percent, 30 years of contributions, 7 percent investment return, and an annuity factor of 11. The defined-contribution results reflect an assumed pay rate growth of 4 percent, 30 years of contributions, 6 percent investment return, and a 6 percent interest-only payout during retirement.

value. If stock market performance exceeded expectations, then the unit value would increase, and the participants' benefit payments would increase. If stock market performance fell short of expectations, then the unit value would decrease, and the corresponding pension payment would reduce.

The idea behind offering variable annuities in pension plans was to give retirees some measure of inflation protection. Generally stock market expectations as specified in the plan would be somewhat less than true stock market expectations, with the result being that the participants' retirement benefit would generally increase over time. However, the strong bear market in 1972 and 1973 had a chilling effect on variable annuity plans, and they have not been widely adopted ever since.

But fast forward to the current time when employee participants are increasingly dependent upon 401(k) account balances for retirement benefits. The choices they have are to invest in fixed income securities, thus locking in potentially lower investment return rates, or to invest in equities with the ever-present possibility that a market crash could put an enormous dent in their retirement savings. Given that this is the new reality faced by employees, the concept of having a portion of their retirement benefit provided by a variable annuity may not be as unappealing as it once was.

Furthermore, the variable annuity concept can completely eliminate the two defined-contribution inefficiencies identified above. Investment responsibility can be returned to professional money managers, and the mortality risk is completely transferred back to the plan. Hence a 5 percent employer contribution can again be targeted to provide 21 percent of pay benefit, not the 12 percent of pay defined-contribution benefit that emerges when realistic projections are used.

If the entire benefit is subject to the variable annuity concept, it is possible that the plan sponsor could be completely immunized from the volatility issues. The employee participants would take the full hit, just as they do now with a defined-contribution approach, since the employees' variable annuity benefit is adjusted up or down to reflect changes in the market value of assets. However, it is not necessary that the entire defined benefit be made subject to the variable annuity approach. For example, half the benefit could be set at the traditional fixed level, and half could be based on variable annuity units. In this situation, the cost of volatility would be equally shared between the plan sponsor and the employee participants.

The basic idea of variable annuity benefits can even be expanded beyond its initial design. For example, the basic plan could still provide a fixed benefit, but with the variable feature kicking in only when market performance falls outside some corridor. Under this concept, employee benefits still would be reduced in a significant market downturn, but the reduction could be far less than it currently is under 401(k) plans. Yet under this concept, the employer sponsor would not have to absorb the full hit of all volatility as it currently does with a traditional defined-benefit plan. From both a participant's standpoint and the employer's standpoint, the willingness to share potential pain of market shortfalls allows for a plan that can be designed to maximize the benefit

value of each contribution dollar. This appears to be an outcome that both participants and sponsors should welcome.

2.3 Floor Plan Approaches to Volatility Management

A floor plan is a retirement program that has both defined-benefit and defined-contribution features. The basic buildup of the benefit is through a defined-contribution account. This design feature allows the plan sponsor to clearly show the employee participant the value of the employer's contribution and how the account is growing over time. The additional floor plan design element is that the program features a guarantee. If, at retirement, the account is not sufficient to provide a certain level of benefit, the defined-benefit portion of the program makes up the difference.

By setting a certain minimum level of retirement benefit, the workforce management feature of the retirement program is restored. Furthermore, since the employer is taking on the commitment to provide a specific benefit, and is using employer-contributed defined-contribution dollars to meet this commitment, the employer can make a legitimate claim to assume investment responsibility for the plan's defined-contribution assets. The investment of these assets can return to professional money managers. Presumably, this will increase the plan's overall rate of investment return. Since the plan's basic retirement benefit is provided in annuity form, the mortality risk concern described above is significantly reduced.

Finally, because of the defined-contribution feature, the overall benefit accumulation process tends to be front-loaded. For most active employees who are age 55 or less, the entire projected benefit would be provided by the account value. Hence, from an employer's perspective, volatility management only becomes an issue for a fairly small portion of the active plan participants, and is reduced significantly.

The employment of a variable annuity approach to provide retirement benefits can also be used as part of the floor plan annuity benefit to aid in the volatility management of benefits currently in payment status. The floor plan concept is highly flexible and can be tailored to meet almost any desired benefit adequacy and accumulation target.

Summary

Volatility and volatility management are issues that will always be present. As long as the plan sponsor deems that it is desirable to try to maximize investment income by including equity investments, the sponsor will need to deal with the consequences of volatility in the equity markets. To date, the tools commonly used for volatility management from an investment-only perspective are relatively few, and come with a fairly steep price in terms of reduced retirement benefits for a given contribution level. Asset smoothing techniques generally do not provide for lower benefits, but have their own set of problems related to the potential for delayed recognition of incurred liabilities. Finally, all

of the current approaches seem to make one side of the equation, either the sponsor or the participants, fully and completely responsible for the consequences of volatility.

By considering new benefit plan designs that involve either a variable annuity or a floor plan concept, volatility can be shared between sponsors and participants. Given that both parties in the plan have a vested interest in getting the maximum benefit for each dollar of contribution, perhaps an agreement to share the potential volatility costs may be the best outcome for all.