

TRENDS AND ISSUES

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A RISK-MANAGED APPROACH TO DESIGNING HOSPITAL PENSIONS FOR THE 21ST CENTURY

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INTRODUCTION

The combination of the bear market investment losses of 2001 and the more recent sub-prime related market disruptions have added heavy financial burdens on both employers and employees. Regardless of whether a sponsored retirement plan is a defined benefit (DB) plan, a defined contribution (DC) plan or a hybrid approach, the investment losses have likely been significant. Even well-funded pension plans are seeing higher pension contribution requirements at a time when employer budgets are already highly stressed. A 2008 American Hospital Association survey indicated about 60% of hospitals with DB plans are expecting to see increased pension costs. The prospect of higher payroll taxes to fund Social Security and Medicare benefits also loom.

All of these factors have created an environment in which budget-constrained employers have begun to take a new look at the design, funding, administration and governance of their retirement plans. This process will require a thoughtful and considered reexamination of the basic tenets of these plans. This reexamination should focus on the benefits and risk management objectives surrounding retirement benefit design and funding: 1) workforce attraction and retention, 2) benefit adequacy and security, and 3) funding affordability and volatility.

Recent experience has clearly shown that there is no such thing as a riskless retirement plan. The standard approach to pension design and funding has, however, failed to identify and measure the risks that do exist. Historically, the approach has principally been to: 1) establish benefits levels, 2) determine the cost and 3) budget as much toward achieving the objective as could be afforded.

Largely missing from this process is an assessment of the risks associated with any particular plan design. Key questions regarding existing risks, their magnitude, the distribution of risk burden, and potential risk mitigation have often been inadequately considered. The failure to assess these risks can be serious in terms of failed pension financing schemes and/or inadequate and insecure retirement benefits.



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One of the advantages of identifying and managing retirement plan risk areas is a greater tendency to adopt plan designs that are more appropriately balanced in the sharing of financial risks between employers and employees. Moving forward with such an approach will mean the increasing use of “hybrid” and “combination” approaches that include elements of both traditional DB and DC plans. Examples of these include cash balance DB plans, combination DB/DC arrangements, and DC plans with guaranteed annuity benefit components.

This paper proposes that plan sponsors add financial risk management processes when reconsidering the future of retirement design and funding. Some of the principal risk areas to be assessed include:

- **DB plan risks**

- Long-term funding risk—the risk that investment and other actuarial experience may be worse than expected, forcing contribution rates to increase above acceptable levels over the long-term.
- Short-term funding volatility risk—the risk that investment return volatility will cause contribution rates to increase above acceptable levels over the short-term.
- Inflation risk—the risk that the value of accrued benefits will be eroded by inflation.

- **DC plan risks**

- Longevity risk—the risk of participants outliving their retirement assets.
- Inflation risk—the risk that the value of accrued benefits will be eroded by inflation.
- Funding risk—the risk that contributions to participant accounts will be insufficient to achieve retirement benefit objectives.
- Investment risk—the risk that investment returns on those contributions will be insufficient to fund an adequate and secure retirement benefit.

In many cases the level of risk for both DB and DC plans can be managed to a significant extent through more appropriate plan design and funding policies. This increases the likelihood of meeting the benefits and financial objectives of both the plan sponsor and the participant, regardless of whether the plan is DB or DC in design.

The current challenge to employers is finding a process that clearly identifies the issues and the basis for deciding the best achievable solution subject to their budget constraints. One way to meet this challenge is to approach retirement plan design as follows:

- First, develop a basic retirement benefits policy. Define the goals and objectives the sponsor has for the retirement plan.
- Second, apply a financial risk management filter. Identify the plan design elements that are most likely to achieve the benefit goals and objectives given available financial resources and potential market fluctuations.

The advantage of such an approach is that it does not prejudge what plan design is better. It does not assume that either DB or DC plans are inherently superior to the other. Instead, it identifies the most appropriate design as the one that is most likely to meet the benefits objectives of the plan sponsor subject to its financial constraints.

RETHINKING PLAN DESIGN WITH A RISK MANAGED APPROACH

Any discussion of the relative advantages and disadvantages of DB and DC plans centers ultimately on the question of who should bear the financial risks associated with providing an adequate and secure retirement benefit. DB proponents correctly point out that DC plans can fail to meet retirement income security objectives because investment risk, and often funding risk, is solely on the shoulders of participants. On the other hand, some critics of

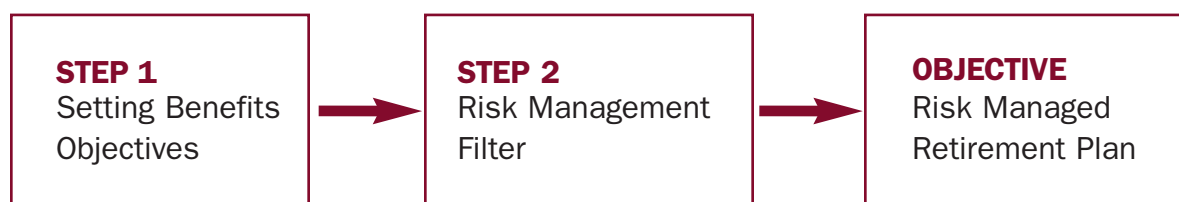
DB plans argue that many employers can not afford the financial burden of fully guaranteeing retirement benefits and that such plans often do not produce the intended benefits for a mobile workforce.

Financial risks are inherent to all retirement plans, regardless of plan type. The real questions from a policy perspective are 1) who should bear the risk and 2) how can the risk be managed?

It is critical that both questions be explicitly addressed. Many of the well-known retirement plan train wrecks involving DB funding problems and DC investment losses for participants can be attributed to the failure to adequately recognize financial risks and take steps to mitigate those risks.

Identifying and managing retirement plan risk areas will lead to plan designs that are appropriately balanced in sharing the financial risks between employers and employees. This will likely mean the increasing use of “hybrid” and “combination” approaches that include elements of both traditional DB and DC plans.

It goes without saying that retirement plan design should be based on sound benefits and funding policies aimed at achieving the plan sponsor’s goals and objectives for the plan.



STEP 1: SETTING BENEFITS OBJECTIVES

The first step in developing a sound retirement benefit policy is to identify the retirement benefit objectives of the plan sponsor for each of the following areas:

- Retirement Income
- Disability benefits
- Survivor benefits
- Retiree health insurance
- Workforce attraction and retention

RETIREMENT INCOME OR WEALTH ACCUMULATION?

The plan sponsor needs to decide whether the primary purpose for the plan should be to 1) provide adequate and secure retirement income, or 2) maximize wealth accumulation that can be converted to retirement income. Each reflects different philosophies that will affect the ultimate plan design and the range of benefit outcomes that could occur.

Objectives are not established in a vacuum. They should be guided by the workforce attraction and retention needs of the plan sponsor, subject to available financial resources. For each benefit type, basic questions should be asked that address eligibility (who should benefit? Should part-time workers be included? Should there be age and service requirements for eligibility?), adequacy (how much should be provided by the plan?) and cost-allocation (who pays how much for the sponsored benefit?)

APPROPRIATE INCOME REPLACEMENT

Benefit policy should address the level of retirement income that will be targeted by a sponsored plan. Retirement income adequacy is typically measured in terms of the fraction of a participant's ending salary that is replaced during retirement. This "income replacement ratio" is measured first at the time of retirement and then continuously throughout retirement to see how it has been affected by inflation.

Plan sponsors should set desired retirement income replacement objectives, which usually come in a range of targeted ratios that reflect differences in pay levels and Social Security benefits. Figure 1 provides an example of possible target income replacement ratios designed to maintain standards of living after retirement based on an ongoing benefit adequacy research study. The income replacement targets are higher than the traditional 70% target often used as a rule of thumb. The 78% – 94% numbers reflect, in part, the higher costs of retiree health care that current and future retirees are likely to experience.

FIGURE 1
TARGET INCOME REPLACEMENT RATIOS TO MAINTAIN STANDARDS OF LIVING IN RETIREMENT

PRE-RETIREMENT SALARY	GROSS INCOME REPLACEMENT RATIOS
\$20,000	94%
30,000	90
40,000	85
50,000	81
60,000	78
70,000	77
80,000	77*
90,000	78*

*Replacement ratios for these higher salary levels are affected by higher marginal tax rates

Source: 2008 Georgia State University/Aon RETIRE Project Report-Tax Savings and Expenditures Model

DISABILITY BENEFITS?

Disability income adequacy is also measured by income replacement ratios. Short-term disability benefit objectives are usually addressed in other contexts, such as sick leave and paid-time off policies, and are not further addressed here. Long-term disability benefits objectives (work related and non-work related) are addressed through a variety of benefit programs, including long-term disability insurance, workers' compensation benefits, Social Security, and disability pensions. Each of these sources should be taken into account and coordinated to ensure that benefits provided are appropriate in total.

Disability income replacement adequacy is established using criteria similar to that for retirement income adequacy and may range from 60 - 80% of pre-disability pay. The lower target levels are the result of an employer objective for the benefit to function as a limited safety net and to have benefit levels that do not discourage return to work.

SURVIVOR BENEFITS?

Survivor benefit objectives are defined separately for pre-retirement death and post-retirement death of the participant. The objectives may include:

- Maintaining the standard of living for the participant's dependants.

- Protecting future retirement income that the participant's survivors would have shared had the participant lived.
- Meeting immediate financial needs of survivors (e.g., lump-sum payments to help with funeral costs).

Survivor benefit objectives can be addressed through a combination of employer-provided and voluntary employee-funded life insurance and pre-and post-retirement survivor benefits provided through the retirement plan. Each of these should be coordinated to ensure benefit objectives are met in the most cost-efficient manner.

WHAT ABOUT RETIREE HEALTH COSTS?

A 2009 EBRI study indicates that a 65-year-old man who has median drug expenditures, does not have employment-based retiree health benefits and supplements Medicare with the individually purchased Medigap (Plan F) and Medicare Part D outpatient drug coverage would need \$86,000 in current savings for a 50 percent chance of having enough money to cover health care expenses in retirement, or \$177,000 for a 90 percent chance. An analogous woman would need current savings of \$125,000 for a 50 percent chance of having enough money for retiree health expenses, or \$221,000 for a 90 percent chance.¹ These estimates of savings needed to cover retiree health care expenses do not vary with the earnings level of an individual, meaning that necessary savings as a percentage pay is higher for lower paid individuals.

The implications of retiree health care costs on retirement plan design are important regardless of whether the plan is defined benefit, defined contribution, or hybrid in nature. The analysis in this paper used the Georgia State University/Aon RETIRE Project income replacement targets as a benchmark for retirement income adequacy because they account for retiree health care costs. However, there is significant uncertainty surrounding future health care costs and estimates of necessary savings can vary markedly. Therefore, it could certainly be argued that income replacement rates may need to be even higher to meet the cost of paying for health care during retirement. It is clear that much more needs to be done to develop best practice standards for retirement programs that more fully addresses this important and expensive need.

PLAN TYPE AND WORKER RECRUITMENT AND RETENTION

One of the purposes of providing retirement benefits is to enhance the ability of employers to attract and retain workers. There is little evidence which shows definitively that either DB plans or DC plans are inherently better in meeting this objective. Again, plan design has a significant role to play in determining what types of workers will benefit more under either plan type.

Benefit accrual patterns under DB plans tend to be back-loaded meaning that the present value of benefits earned by longer service employees is greater than that earned by shorter-service workers. DC plans tend to benefit employees the same regardless of tenure and therefore tend to allow short-tenured workers to accrue greater benefits than they would accrue under a DB plan. DB plans would therefore be attractive to individuals not anticipating future employer changes. Given their benefit accrual patterns and inherent benefit portability, DC plans would be attractive to individuals who anticipate changing employers after several years.

Benefit portability at job change is a feature that workers would likely find attractive. Such portability should therefore not harm an employer's ability to attract workers. It may, in fact, enhance it.

Back-loaded benefit accruals inherent in traditional DB plans create an incentive relative to DC plans for an employee to remain with the employer and thus increase retention rates. But this may also result in workers remaining on a job when they would otherwise want to leave or when their employer might want them to leave. If worker turnover is a concern for an employer, vesting schedules in a DC system could be structured (within limits) to encourage workers to remain with their employer a certain minimum number of years. DC plans can also be designed to backload benefit

1 These amounts do not include any additional cost for long-term health care.

accruals in a manner similar to that provided by DB plans; contribution rates could be structured to increase with an employee's age or years of service as can be found in so-called "age-weighted" or "service-weighted" plan designs.

PLAN DESIGN, BENEFIT ADEQUACY AND COST

Benefit adequacy is a function of plan design. An "adequate" plan can be structured under either a DB or a DC arrangement. Comparing the relative outcomes of existing or proposed retirement plans is challenging. There are numerous reasons why different retirement plan types can generate differing levels of retirement income for a worker. Furthermore, comparing a DB plan's benefit formula to a DC plan's contribution and investment policies is inherently difficult; comparing benefits accrued in a period to contributions and investment earnings in that period is unenlightening.

In comparing plans, sponsors should account for all of the following:

- Differences in the basic benefit accrual or contribution formula.
- Vesting periods—shorter vesting periods preserve benefit accruals.
- Differences in the number of years worked under the plan—all else equal, longer-tenured workers will receive greater benefits in retirement.
- Differences in the age of workers—depending on plan design, DB plans usually favor older workers in terms of the value of benefits accrued each year; DC plans typically provide equivalent benefit accruals regardless of age, but plan contribution levels can be age- or service-weighted if a plan sponsor wants to mimic DB accrual patterns.
- Differences in earnings at end of career—benefits under a DB plan are typically tied to final earnings, so all else being equal, a worker with greater final earnings will receive a greater retirement benefit.

Regardless of plan type, more generous designs are more costly to fund. Higher benefits cost more regardless of whether the plan is DB or DC in design.

STEP 2: APPLYING FINANCIAL RISK MANAGEMENT FILTERS

The four primary risk areas in a retirement plan include the following:

- *Investment and Funding Risk*—the risk that contributions and investment returns on those contributions will be inadequate to fund promised benefits under a DB plan or inadequate to support retirement income objectives under a DC plan. The employer bears this risk under a DB plan and the individual usually bears it under a DC plan.
- *Inflation Risk*—the risk that inflation will decrease the value of the earned benefit.
- *Mortality (including longevity) risk*—the risk that the participant will die before or live longer than expected.
- *Disability risk*—the risk that the participant will become disabled before becoming eligible for regular retirement benefits.
- *Termination Risk*—the risk that the participant will end employment before vesting and forfeit accrued benefits or otherwise terminates at an early age with relatively small vested accrued benefits.

The full range of implications of these risks should be considered. For example,

- What will happen if DC plan participants experience poor investment returns? Employees may retire at a lower than expected standard of living, or they may delay leaving the workforce. In the latter case, plan sponsor workforce efficiency and retention may be negatively impacted if employees cannot afford to retire. In other words, employers may bear some of the price for poor DC investment performance as well as the participants themselves.

- What if a DB plan sponsor cannot afford to make up for poor investment returns? The current higher costs may be pushed into future years and in the case of DB plans that are contributory (e.g., a public sector hospital), participants may be made to share in the higher costs through increases in their required contributions. Participants may be provided lower benefit levels for future service to help mitigate current plan costs. Future employees may receive lower benefits to help mitigate current plan costs. The plan may be frozen and eventually terminated. In other words, DB plans are not completely riskless to employees who can bear some of the risk of poor DB plan investment performance.
- What happens if DC participants quit, take their benefits, and spend them instead of saving for retirement? This is known as retirement benefit “leakage,” and again, employees may retire at a lower standard of living or delay retirement.

FILTERING INVESTMENT AND FUNDING RATE RISK—DB PLANS

The funding of DB plans is complex and involves the use of actuarial and economic predictions regarding workforce and market experience. It also involves the use of actuarial funding methods that allocate the cost of funding plan liabilities over current and future payrolls of participating employees. The basic objective is to ensure that the benefits earned by employees each year are properly funded in the year earned.

Because investment performance, mortality, turnover, average retirement age and other factors can vary from expectations over time, there is a risk that this objective may not be achieved. If expected experience does not come to pass, then future required employer contributions may be significantly higher than expected, potentially leading to reductions in future benefit accruals, accrued benefit freezes and plan termination. This is why it is important for plan sponsors to establish benefit funding policies that adequately manage the investment and funding rate risk for DB pension plans.

The size and sometimes irreversible nature of DB pension commitments make it essential that plan sponsors understand the financial positions of their DB plans. Sufficient financial information is needed so that the plan sponsors can reasonably assess whether both the long-term predicted cost of the plan and the shorter-term funding volatility are acceptable.

Long-term affordability of a retirement program is important, but the program must also be affordable over the short-term. The issue here is volatility of required contribution rates; short-term swings in investments could cause contribution levels to rise to unacceptable levels. To help evaluate this risk it may be appropriate to conduct *stress tests* to see what happens to required contributions if the long-term actuarial investment return assumption is not met for several years.

Another valuable way to examine short-term affordability is to conduct probability studies (sometimes called stochastic or Monte Carlo modeling). Such studies help determine the likelihood that short-term (1- 5 years) investment losses will cause contribution requirements to increase beyond levels considered acceptable by the sponsor. For example, a hospital sponsoring a DB plan with an actuarially required contribution rate of 10% of compensation conducts a probability study and finds there is a 50% chance that within 5 years poor investment experience could require that the contribution rate increase to 20%. Hospital A must decide whether it can or cannot afford to take the chance that it may have to pay the 20% contribution rate. If not, then alternative funding or plan designs need to be considered.

The 2001 terrorist attack on the US and the more recent financial market liquidity crunch and its affect on the markets is a stark reminder that economic modeling alone cannot adequately predict the level of retirement funding risk. Short-term economic upheavals coming from global political events need to be taken into account by plan sponsors in assessing the ability to tolerate pension funding volatility.

FILTERING INVESTMENT AND FUNDING RATE RISK—DC PLANS

Three major factors that impact benefit outcomes in DC plans include: 1) employer and employee contribution levels, 2) asset allocation decisions by participants, and 3) market performance and volatility.

Inadequate funding is the largest risk a worker can face in accumulating the assets needed for an adequate and secure retirement. Recent research has clearly demonstrated the overriding importance of contribution levels over other factors, even asset allocation, for ensuring an adequate level of retirement income.² Figure 2 demonstrates that the DC contribution rate in the 10-14% of pay range would be expected to achieve a target wage replacement of 70%.³

FIGURE 2
RETIREMENT INCOME REPLACEMENT PROJECTIONS UNDER A DC PLAN

INITIAL SALARY	REPLACEMENT FROM DC PLAN	REPLACEMENT FROM SOCIAL SECURITY	COMBINED REPLACEMENT
10% OF PAY TOTAL CONTRIBUTION RATE			
\$30,000	41.8%	33.8%	75.6%
\$50,000	41.8	28.6	70.4
\$70,000	41.8	23.5	65.3
12% OF PAY TOTAL CONTRIBUTION RATE			
\$30,000	50.2%	33.8%	84.0%
\$50,000	50.2	28.6	78.8
\$70,000	50.2	23.5	73.7
14% OF PAY TOTAL CONTRIBUTION RATE			
\$30,000	58.5%	33.8%	92.3%
\$50,000	58.5	28.6	87.1
\$70,000	58.5	23.5	82.0

Note: Income replacement shown as a percentage of final pay. Calculations assume individual is hired at age 30 and retires at 65, salary increases at 4.5% annually, the pre-retirement investment rate of return is 7% per year, the annual growth rate in average national wages for Social Security indexing purposes is 3.5%, a single life annuity is purchased at retirement and the payout rate is based upon 5% interest and the Annuity 2000 mortality table (with ages set back 2.5 years).

A plan sponsor can address this risk by incenting employee contributions through the level and generosity of a matching contribution. But in a model where the level of employee contributions is discretionary and the level of employer contributions depends on those discretionary employee contributions, there is no guarantee that combined contributions will be adequate. Alternatively, a plan could be structured with non-discretionary employer and employee contributions designed to target an adequate retirement income level assuming realistic investment returns.

The investment objective in a DC plan should not be “exceptional” returns and investment policy should not be viewed as a means to compensate for inadequate contributions. Rather, the investment objective in a DC plan should be to maximize the likelihood given past market experience that contributions grow into an amount sufficient to fund

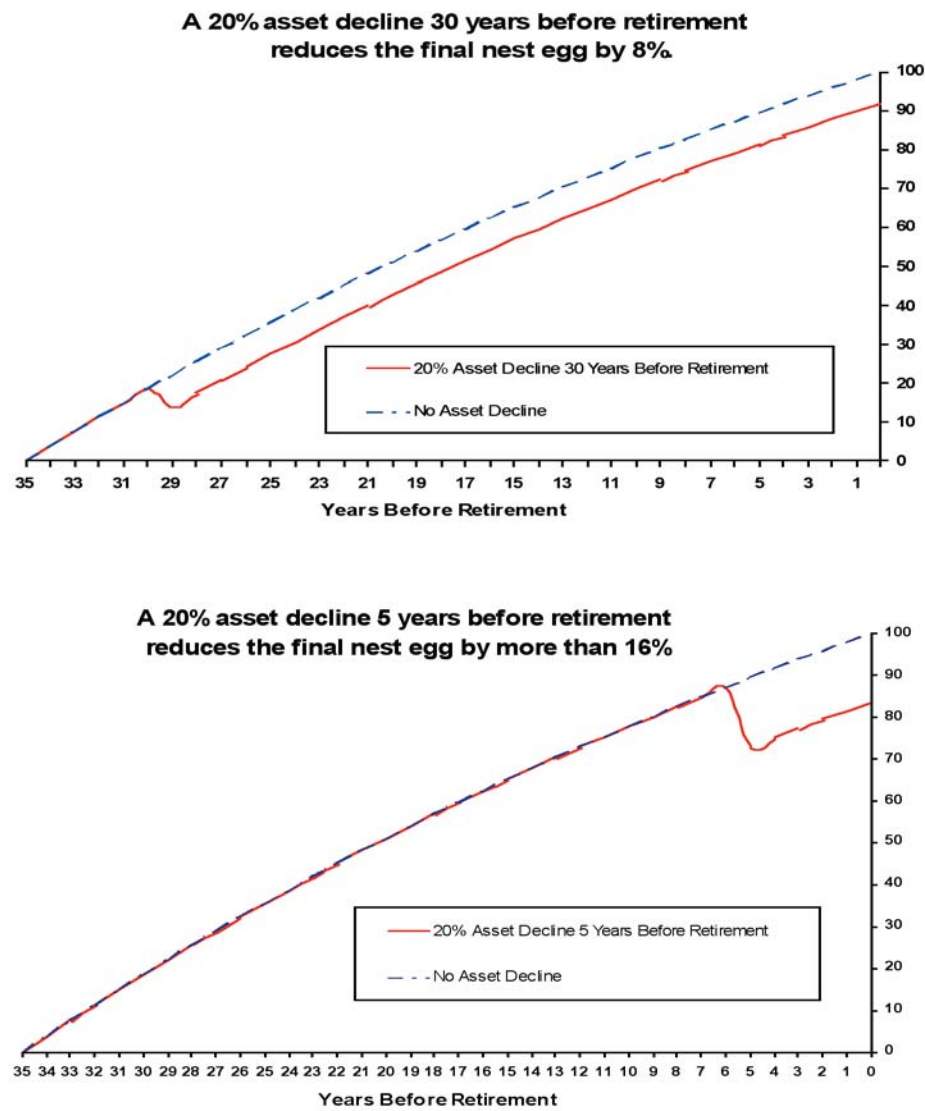
2 Hammond, Brett P., and David P. Richardson. “A New Look at Retirement Savings and Adequacy: Individual Investment Risk Management and the Asset Salary Ratio.” Prepared for the Pension Research Council Annual Meeting, April 30, 2009.

3 All projections of income replacement percentages are very sensitive to changes in the underlying economic assumptions, including: salary growth rate; pre-retirement investment return; and the assumed annuity payout rate.

an adequate retirement income. Investment risk is inherent to all DC plans and must be recognized and addressed by plan sponsors. DC participants are particularly vulnerable to investment losses occurring in the years immediately preceding planned retirement.

Figure 3 illustrates how the timing of significant investment losses occurring during the years leading up to retirement affects the amount of retirement income for DC participants. The first graph shows the impact of a 20% market decline at age 30. It demonstrates that a 20% market downturn at an early age has a relatively small impact on the final benefit – reducing the ultimate retirement income by about 8%. In contrast, the second graph shows that the impact of a 20% market decline at age 60 can reduce retirement income by more than 16%. A DC plan participant with this kind of loss may have to delay retirement or decide to accept a lower standard of living. This is a critical risk area that DC plan designs must take into account and manage properly.

FIGURE 3



While a DC plan participant is usually allowed to decide how his or her retirement funds are invested across available asset classes, the plan sponsor can manage the investment risk by limiting the options offered under the plan to a number (no more than 15-20) and type of funds suitable for the objective of providing retirement income. For this purpose, a distinct, diversified set of investment funds ranging from equity funds to bond funds to money market instruments is appropriate.

Where participants are provided investment discretion, sound plan design procedure for a core or primary retirement plan considers the inclusion of investment options that also guarantee income, such as annuities. In addition, target-date lifecycle funds, which rebalance regularly and adjust investment allocations to limit risk based on number of years until planned retirement, eliminate the need for investment decision-making by workers and make a sound default option. Custom designing the glide path of a lifecycle offering should be considered to match the risk tolerances of the plan sponsor and its employees.

A plan sponsor interested in limiting the chance for poor investment choices and investment risk, including the risk of late career investment losses, can even eliminate participant discretion completely; for example, by requiring investment in risk-managed investments such as target-date life-cycle funds.

Investment and financial education also can have a positive impact on plan participant investment decisions. A recent study⁴ found that participants with a relatively high degree of risk aversion invest a larger share (an additional 20 percentage points more) of their assets in equities after attending a retirement class on asset allocation in self-directed DC plans. Furthermore, individuals who are the furthest from retirement make the largest reallocations to equity. A well-designed DC plan will provide appropriate education about investment basics and available options under the plan. Specific investment advice regarding options under the plan can also be provided through the plan. This typically happens through third-party vendors.

DB INVESTMENT EFFICIENCY

DB plans with professional asset managers typically earn greater investment returns than the average DC plan participant.⁵ Differences in investment returns earned by professional money managers and typical DC participants are not surprising,⁶ but should they be troubling? This difference in rates of return often leads to concerns that it will translate into lower retirement income levels from DC plans relative to DB plans.

Given that contributions plus investment returns must equal benefits plus expenses, it is not necessary that higher DB investment returns would or should translate into higher benefits than those earned by individuals in a DC system. While rates of return impact benefits under a DC plan, benefits are determined by formula under a DB plan and rates of investment return are not elements in such formulas. Any “excess” investment returns in a DB system could be used to increase benefits, decrease contributions, or simply to increase funding levels by adding to plan assets as a buffer against future market downturns.

4 Muller, Leslie A. “Investment Choice in Defined Contribution Plans: The Effects of Retirement Education on Asset Allocation.” *Benefits Quarterly*. Vol. 19, No. 2, Second Quarter 2003.

5 See, for example, “Defined Benefit vs. 401(k): The Returns for 2000-2002.” Watson Wyatt Worldwide *Insider*, December 2004.

6 Reasons include inappropriate investment selections by defined contribution participants, economies of scale in the operation of defined benefit plans, an ability of DB plans to take additional investment risk because of a longer investment horizon, and an ability of defined benefit plans to leverage access to specialized asset classes (e.g., private equity or alternative investments) not typically available to defined contribution plans.

The ability of a DB or DC plan to provide adequate retirement income levels would therefore seem to be the more appropriate evaluation criterion as opposed to focusing on rates of return.⁷ Notwithstanding this point, higher investment efficiency is a desirable objective and should be a concern when designing DC plans. Many of the investment inefficiencies of DC plans can be mitigated by the use of more appropriate investment vehicles including life-cycle funds, which can be structured to include many of the same asset classes and tighter management used by DB plans, thus realizing a significant portion of the available higher risk-managed returns.

FILTERING INFLATION AND LONGEVITY RISK

Another retirement income concern is that retirees could be worse off due to a lack of inflation protection for their benefits. For DC plans, there is the additional possibility of retirees outliving their savings.

Regardless of whether the plan is DB or DC, longevity and inflation risk protection is a function of annuitization design. DB plans that have automatic cost of living adjustments cost more than those that do not. Inflation protected DC annuity options are likewise more costly than annuitization options without. Neither DB nor DC is inherently better or more cost effective for this purpose. Automatic cost-of-living adjustments are rare in private sector DB plans.⁸

The degree to which this issue is a concern in DC plans is a function of the payout options offered under the plan and the decisions made by a participant once he or she reaches retirement. An annuitization payout option in the plan enables a participant to fully address the risk of outliving his or her assets. An annuitization payout could be made mandatory for a specified minimum level of accumulations in plan accounts, or it could be one of several payout options available under the plan. In the latter case, it could be made the default choice. A degree of inflation protection can be achieved with a payout annuity via a graded benefit schedule, with a variable payout annuity, or specialized inflation-protection annuities.

Annuitizing DC account balances exposes retired participants to annuitization rate risk. This risk means that the level of income payments that can be purchased under a fixed payout annuity will vary over time depending on prevailing annuity purchase rates available in the open market. For example, in one year a participant may be able to buy an annuity that pays \$1,000 per month with a \$150,000 account balance. However, at a different point in time when economic conditions were more favorable, the same individual may be able to purchase a contract paying \$1,100 per month.

DB plan participants are not subject to annuitization rate risk. The plan sponsor carries this risk as part of the DB plan's overall funding rate risk. Variable annuities do not subject participants to annuitization rate risk.

Annuitization rate risk can be managed in a number of ways, including 1) using accumulation period annuities as a funding vehicle (such as the TIAA Traditional Annuity), 2) providing financial planning and advice that can help participants stage annuity purchases and choose an appropriate mix of fixed annuity, variable annuity and periodic payment strategies and 3) allow the required level of annuitization to be attained over a period of several years subsequent to retirement.

7 Research comparing retirement income outcomes between defined benefit and defined contribution plans is scarce, likely because of the comparability issues discussed here. A recent attempt is Samwick, Andrew A., and Jonathan Skinner. "How Will 401(k) Pension Plans Affect Retirement Income?" *The American Economic Review*: Vol. 94, No. 1, March 2004. The authors find that retirement benefit levels are higher with 401(k) plans than defined benefit plans; they estimate that the typical worker could expect an extra 38 percent of retirement income from 401(k) plans.

8 According to U.S. Department of Labor data for 2000 (latest year available), only 7 percent of defined benefit participants in private-sector employers nationally had automatic cost-of-living increases as part of their plan.

FILTERING MORTALITY AND DISABILITY RISK

The level of disability and pre-retirement death protection from DB plans varies from plan to plan. Some will provide a base level of coverage after a period of service. Disability benefits are frequently also coordinated with other payments from workers' compensation programs and Social Security. The costs of disability and death benefits are usually embedded in the total cost of the DB program.

With a DC plan, the disability benefit or survivor benefit is usually the account balance. Depending on contribution levels, returns, and tenure in the plan, the account balance may or may not be adequate in such instances.

Planning for such disability and pre-retirement death risks is again a plan design issue. Both DB and DC plans can be designed to cover these contingencies. Combining a DC plan with a disability income insurance plan and a life insurance plan can achieve the same type of protection for workers and their families as incorporating the disability and life insurance into a DB plan.

FILTERING TERMINATION RISK

For DC plans, the level of retirement income benefit is determined by 1) the total contributions made to the participant's account during employment, 2) the related investment gains or losses and 3) distributions prior to retirement. For DB plans, retirement income outcomes are determined by 1) the benefit formula (e.g., 1.5% x years of service x final average salary) and 2) the work history of the individual.

The work history of individuals can have a substantial impact on the amount of retirement benefits earned. Generally, when one looks at the value of benefits earned each year, DB plans tend to favor older, longer-term workers relative to younger, shorter-term workers. Figure 4 provides an illustration regarding how work history can affect income replacement outcomes from DB and DC retirement plans (without taking into account Social Security or personal savings). In this example, individuals who terminate before age 65 tend to earn better benefits under DC plans, while full-career workers tend to fare better under traditional DB plans.

FIGURE 4
RETIREMENT INCOME REPLACEMENT RATES UNDER DB AND DC PLANS FOR DIFFERENT
ENTRY AGES AND TERMINATION DATES

ENTRY AGE	PLAN	BENEFITS PAYABLE AT AGE 65 AS PERCENTAGE OF EARNINGS IF EMPLOYMENT TERMINATES AFTER:			
		10 YEARS	15 YEARS	20 YEARS	CONTINUES TO AGE 65
25	DC	19.6%	27.5%	34.3%	53.7%
	DB	4.6	8.4	13.7	60.0
30	DC	17.0	23.8	29.7	43.2
	DB	5.6	10.3	16.7	52.5
35	DC	14.7	20.7	25.8	34.1
	DB	6.8	12.5	20.3	45.0
40	DC	12.8	17.9	22.4	26.3
	DB	8.3	15.2	24.7	37.5
45	DC	11.1	15.5	--	19.4
	DB	10.1	18.5	--	30.0
50	DC	9.6	--	--	13.5
	DB	12.3	--	--	22.5

Assumptions: Salary increases 4% annually. DB formula is 1.5% of final 3-year average salary times years of service. DC benefits are based on a contribution rate of 10.0% of salary and a rate of return of 7% before retirement and 4% after retirement. The mortality table used is the A2000 Merged Gender table set back two and a half years; benefits are based on a single life annuity.

This tendency, however, no longer holds when individuals have several employers through the course of their working careers. For example, using data from Figure 4, assume a person worked at three different employers between the ages of 30 and 65. Working from 30 to 40 in a DB plan replaces 5.6% of Age 65 income. Working under a DB from 40 to 50 replaces 8.3% of Age 65 income. Working from 50 to 65 replaces 22.5% of Age 65 income. The three amounts combined result in a 36.4% replacement ratio. DC coverage with a 10% contribution rate between the ages of 30 and 65 replaces 43.2% of income at age 65. The point is that DC plans tend to benefit individuals who change jobs multiple times through the course of a career more than DB plans.

Such tenure-dependent differences in retirement income outcomes between DB and DC plans can be mitigated by altering typical plan design. For example, an age-weighted or service-weighted DC plan that provides higher contributions for older workers or those with longer service can generate benefit accrual patterns that mimic those of a traditional DB plan. The reverse is also true. A so-called “cash balance” plan (a type of DB arrangement) can generate benefit accruals that mimic that of a traditional DC plan with a level contribution rate.

Figure 4 is a stylized example meant to highlight how work history can interact with plan type to significantly affect retirement income outcomes, but the outcomes shown assume that individuals preserve their DC assets at job change by leaving them in their former employer’s plan or rolling them over into an IRA or their new employer’s plan. In fact, many participants, particularly younger individuals and those with smaller accumulations, take lump-sum cash-outs of their account balance at job change. In 2003, 25% of those who had received a lump-sum distribution reported

that they had used at least some of their most recent distribution for consumption; 15% used the entire distribution for consumption.⁹

However, it is also true that most dollars remain in the retirement system when participants change jobs. According to tabulations of Internal Revenue Service data, 75 percent of the dollars distributed to workers under the age of 60 were rolled over into an IRA.¹⁰ The fraction of account balances preserved would be higher if available data accounted for workers who leave their account balances in their former employer's plan.

Such leakage at job change is an issue inherent with typical DC plan design; also, a small but growing share of DB plans is offering a lump-sum option at job change. Plan design could address such leakage by simply not allowing lump-sum distributions at job change.

THE RESULT: A RISK MANAGED RETIREMENT PLAN

The use of a risk management filter process will give plan sponsors a clearer understanding of the retirement design elements that can best achieve their benefits policy goals and objectives subject to available financial resources. Several conclusions become evident in considering such a process:

- Neither DB nor DC plans are inherently superior to the other. Each has features that can make it the best choice depending on the circumstances.
- Funding and investment risk is the largest risk in both DB and DC plans. While typical designs for both plan types have not adequately managed this risk to an acceptable level, each has the ability to do so if the plan design incorporates the right structures. To this end new approaches should be considered, including 1) requiring additional funding for DB plans and 2) requiring non-discretionary employer and employee contributions in DC plans while limiting participant investment choices and requiring the provision of trustee-managed investments, such as life-cycle funds.
- DC plan sponsors should not shy away from becoming more paternalistic. In particular, longevity risk should be managed by requiring some form of annuitization at retirement.
- Other risk areas, such as disability, death, workforce attraction and retention, can be effectively managed through plan design under either a DB or DC structure.
- DB plan cost efficiencies exist, but they should be considered against the funding rate risk tolerances and other priorities of the plan sponsor and should not be the sole basis for choice of plan type. Direct comparisons of administrative and investment costs between DB and DC plans tend to be an “apples and oranges” exercise at best. DC plans often provide a much broader array of financial planning and investment education services. Regardless, DC costs can be significantly lowered through proper design.

FACING REALITY: OPTIONS IF AN EXISTING DB PLAN IS NO LONGER AFFORDABLE

Sponsors have a number of options when faced with DB plans that are no longer affordable in their current form. The basic remedial actions, each with advantages and disadvantages, include:

- Reducing benefits (in respect to future service accruals), e.g., normal and early retirement ages can be increased or benefit formulas can be reduced.
- Increasing employee contributions for contributory plans; some public sector health employers do this automatically as part of their existing cost-sharing policy.

9 Copeland, Craig. “Lump-Sum Distributions.” *EBRI Notes*, Vol. 26, No. 12 (December 2005).

10 Yakoboski, Paul. “Lump-Sum Distributions Total \$87.2 Billion in 1995,” *EBRI Notes*, October 1999.

- Seeking greater returns on investments by increasing exposure to equity investments and non-traditional investments (private placements, commodities, etc); some have concluded, however, that there is little additional investment return than can be gained by increasing such exposure further without unduly affecting the level of investment risk taken.¹¹

REDUCING FUNDING/INVESTMENT VOLATILITY

Many DB plans have active programs for reducing investment volatility risk as much as possible while maintaining return expectations. This process of seeking additional “alpha” in their investment portfolios does help mitigate potential impacts of market downturns. Many DB plans also use so-called “asset-smoothing” methods to try and reduce the swings in contribution rates caused by investment volatility. Such smoothing methods will likely be examined for potential adjustments to help further in this regard.

Some DB plan sponsors may also wish to consider reducing funding volatility by implementing new DC plans or combination plans to provide a smaller base DB pension supplemented with a DC component. Over time, the smaller contribution level for the DB component means a smaller proportion of the total retirement contribution rate that is subject to funding volatility. The amount by which total retirement funding volatility can be reduced by adding a new DC plan or component is highly dependent on the nature and funding position of the existing DB plan.

OTHER TRADE-OFFS BETWEEN DB AND DC PLANS

In general, DB plans typically operate with lower total administrative and investment costs than DC plans. However, expenses in both cases are a function of the plan features and options offered, and a DC plan can be structured to be less expensive to administer than the typical DB plan. For example, even though employees need financial planning and investment education services regardless of plan type, DB plans rarely provide such services to their participants at the same level as DC plans. Such options and features are the decisions of the plan sponsor and thus relative plan costs are, in this sense, under the control of the sponsor. A DC plan can be structured and administered at low cost.

It is often debated whether the establishment of a DC plan to replace an existing DB plan would result in cost savings for the plan sponsor. While the answer will be dependent on the specific circumstances of any situation, in most cases it will likely take many years for plan sponsors to realize cost savings from such a conversion. Aside from start-up costs and ongoing administrative expenses, any cost savings will reflect the difference in future benefit accruals (between the old and new plan) and the employee population impacted by the change. For example, if the change in plans only affects new hires, any future cost savings will be relatively slow in realization. However, if the current DB plan is frozen and all employees are enrolled in the new DC plan, there could be a substantial drop in pension liabilities on the balance sheet.

One major benefit of a DC plan is that accrued benefits are always fully funded; moving forward in a DC system, there would be no new unfunded liabilities. Stability and predictability of contributions for the plan sponsor is a given with a DC plan as financial market returns have no impact on required employer contributions.

11. 2006 Wilshire Report on State Retirement Systems: Funding Levels and Asset Allocation, March 14, 2006.

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