Managing longevity risk
(white paper for UBS)

Longevity risk is the ultimate good news/bad news scenario—the good news is that you are not dead and the bad news is that you have run out of money. The risk of outliving financial assets during retirement is front-of-mind for many Americans who are closing in on retirement and are uncertain of whether they will have enough money to let them live comfortably for the next 25 to 30 years.

People translate this risk into a financial need to develop a source for lifetime income. According to results from a July 2007 Harris Interactive independent survey polling pre-retirees and retirees regarding overall views about investing for retirement, longevity risk is a predominant concern. The survey included their interest in, and the need for, lifetime income solutions:

- 93% of Baby Boomers said having a guaranteed source of retirement income other than Social Security is important.
- 66% of Baby Boomers are willing to give up 2% in return annually to ensure that their retirement income is guaranteed for life; 75% are willing to give up at least 1% in return annually.

A natural place to address this risk is within an individual's retirement savings plan. By definition, defined benefit retirement plans deal with longevity risk and lifetime income. In contrast, defined contribution retirement plans have not tended to directly address this issue as participants would find it difficult, if not impossible, to develop their own defined benefit. How do we solve this problem?

Recent legislation provides some energy and guidance toward solutions. With the passage of the Pension Protection Act of 2006 (PPA), plan sponsors are given an unprecedented opportunity to help participants make the right choices for their retirement savings. Recent Department of Labor clarifications to the PPA have identified those 401(k) investment options that can be classified as Qualified Default Investment Alternatives (QDIA): lifecycle funds (target date and target risk), balanced funds and managed accounts.

In the remainder of this paper, we will explore the various investment options insurance companies and assets managers have developed for addressing longevity risk and the need for lifetime income. The marriage of longevity features with QDIA offerings is a logical step. The next generation of QDIA offerings – target date funds, balanced funds, managed accounts - should view the accumulation of assets in a broader and more relevant context with the goal of generating income for the participant's full lifespan and thereby addressing longevity risk.

Current sources of guaranteed lifetime income

There are currently three ways a retiree can obtain "guaranteed lifetime income." Social Security payments, retirement plan (usually defined benefit) payments, and annuities. Consequently, the sole commercial enterprise opportunity has been the annuity, which provides a systematic liquidation of capital. The only commercial industry in this country that can legally offer "guaranteed lifetime income" through annuities is the life insurance industry.

An annuity operates to convert a sum of money into a series of payments over a certain period of time expressed in terms of years, life expectancy, or a combination of both. Basically, "annuitization" requires the annuity contract owner to exchange or "cede" the annuity's accumulated value to the insurer for the insurer's promise to make regular income payments that are calculated actuarially and are guaranteed to extend for a certain number of years or for the duration of an individual's life. Annuity payment calculations rely on the law of large numbers as well as mortality and investment experience. Annuities are either "deferred," meaning they will begin to pay out income at some point in the future, or immediate, meaning payout begins within a year. They are either fixed rate (paying a specified interest rate) or variable (with a rate of return based on underlying investment portfolios.)

Industry statistics suggest that less than 10% of US households have purchased individual annuities, with an even smaller subset purchasing for the explicit purpose of providing "guaranteed lifetime income." The primary difficulty with purchasing annuities to generate lifetime income is the irrevocable nature of the product—the investor must turn over assets to the insurance company in exchange for a future stream of income payments. The assets are no longer available to the investor for any unexpected expenditures that come up, and depending on the type of annuity settlement option chosen, funds may or may not be available to heirs if the annuity contract holder dies. Some annuities also have a level of complexity that can appear daunting to prospective purchasers.

Therefore, the retirement income problem is not simply solved by selling more annuities. The following explores how both the insurance industry and asset managers are attempting to provide solutions for guaranteed lifetime income. We believe that asset managers working together with insurance companies can provide the best simple solutions.

Insurance companies managing longevity risk:

Several insurance carriers have been actively providing various features to help plan participants guarantee a lifetime retirement income. These features are embedded in 401(k) plans, and visible on the plan sponsor's Web site as special investment options that come with a guarantee of lifetime income. Two common offerings are:

- **The longevity insurance approach**: Allows participants to direct a portion of their contributions toward the purchase of future retirement income. The amount of income purchased with each contribution is calculated using an age-based factor. The cost of

the longevity insurance feature is in addition to normal fund fees/expenses, and the underlying investment fund is typically managed by the insurance carrier. When the participant wants to execute the guarantee on the amount of income purchased over the years, he or she must agree to annuitize the account balance. An age-based annuity factor determines the guaranteed amount. Longevity insurance is typically structured as an "in plan" annuity option.

- **A Guaranteed Minimum Withdrawal Benefit (GMWB) for life**: The GMWB operates as an investment option within the 401(k) plan. It is designed to guarantee for life a yearly withdrawal amount from participant account value. This investment option is typically managed by the insurance company and is powered by the insurance company's funds or asset allocation portfolios. The guaranteed withdrawal amount (typically in the range of 5%) is calculated on the greatest of several values: the initial account value placed into the GMWB option, the highest account value achieved on the participant's birthday, or the value when withdrawals will begin. Other "step-ups" in value or guaranteed returns on the income base may be available. Withdrawals usually commence by age 65. Market declines will not affect the guaranteed withdrawal—once a "high water mark" is locked in from a prior birthday, withdrawals will continue in that amount (unless a new high market value is attained on the next birthday.) If poor market performance or prior withdrawals exhaust the account balance, the insurance company will continue payments for the rest of the participant's life.

Withdrawal benefits offer an advantage over annuitization in that the participant's money continues to accumulate in an investment vehicle and therefore control over the asset is retained. Unfortunately, this level of control produces the main disadvantage of a guaranteed minimum withdrawal benefit versus annuitization—a lower monthly income amount. However, many plan participants are willing to make this tradeoff in exchange for the flexibility to take additional emergency withdrawals and to permit a residual account value for heirs. The guarantee can be cancelled at any time, and it is completely portable if the participant leaves the employer but wants to keep the current income guarantee intact via an IRA rollover.

Asset managers attempting to manage longevity risk

When asset managers attempt to manage longevity without the help of an insurance carrier, their approaches tend to fall into three categories.

1. **The retirement income approach**: We are beginning to see industry introductions of mutual funds that produce retirement income. However, the creation of retirement income for a period of time should not be confused with managing longevity risk. Funds that produce retirement income are designed to self-liquidate over a specified time horizon, and will utilize dividends and principal to do so. There is no lifetime guarantee of income and no protection from market loss.
2. **The asset allocation approach**: Other funds attempt to manage longevity risk through asset allocation strategies designed to generate cash flows via a stated distribution rate. An initial challenge to this approach is that very few asset managers

can point to a track record of producing consistently positive total returns from an asset allocation strategy over long periods of time. Even those asset managers skillful enough to have produced such a record cannot legally guarantee to an investor or plan participant that distributions will continue for an entire lifetime without invasion of principal. What the participant is guaranteed is the distribution *rate*, not the amount of income that will be received over time. This presents a difficult scenario for retirees who count on a minimum level of consistent income to meet their needs. Asset allocation alone cannot completely manage longevity risk.

3. **The Monte Carlo Analysis approach**: A fair number of retirement income strategies attempt to manage longevity risk by managing the portfolio to a designated "end date" (typically an advanced age such as 90 or 95) without depleting the asset base. Historic and/or projected portfolio returns over long time periods are modeled with Monte Carlo simulation to determine how long an income plan and assets will last and what the probability of "ruin" will be at various advanced ages. Monte Carlo analysis utilizes the probability of bad outcomes as its primary measure of risk—appropriate, but perhaps not a complete measure of risk. The *magnitude* of bad outcomes in a portfolio is as important as the probability of bad outcomes. Cumulative returns are also far more meaningful than average returns produced in Monte Carlo analysis. Furthermore, for a plan participant worried about outliving income, a probability of ruin (no matter how statistically "low") is no substitute for a lifetime guarantee of income. Aversion to risk is something that Monte Carlo analysis unfortunately does not take into account.

Outliving one's assets during retirement has implications both statistical and emotional. No one can predict exactly how long he or she will live, and published life expectancy tables are meant for the general population, not for one distinct individual. A systematic withdrawal plan solely dependent on the investment framework of the underlying portfolio will not eliminate longevity risk.

It is a new world—asset managers and insurance companies working together

Longevity risk cannot be fully hedged today by an investment approach or a capital markets solution: It requires the participation of the insurance industry as the counterparty—an industry experienced in underwriting both mortality and longevity risk.

Some organizations operating in the defined contribution marketplace understand this paradigm. They are attempting to build solutions that highlight the advantages of annuities, while minimizing their perceived shortcomings. There are four approaches that have been taken:

- **The third party referral approach:** This utilizes the annuity in its present form, and builds a "program" around it that may satisfy the needs of plan sponsors and plan participants. A program can be as simple as a third-party referral service. Plan participants who reach a certain age are made aware of an array of institutionally priced immediate fixed annuities from a number of different

insurance companies and can receive online quotes. Participants can transfer a portion of their 401(k) funds to an annuity upon retirement.

Though simple in construct, this solution is not without its challenges. Immediate annuities are still not a mainstream product among the investing public. Drawbacks are the irrevocable nature of the product and inflexibility of some of the features. Behavioral finance also tells us that people find it difficult to turn what they may consider a large retirement nest egg into a much smaller stream of income payments. While this retirement income solution may provide a level of simplicity to plan sponsors, there remains the challenge of educating participants about the merits of immediate annuities.

- **The wealth target approach:** Another approach that utilizes annuities is an attempt to transform longevity risk into investment risk. Instead of utilizing lifetime income as the goal, a portfolio is managed so that the cost of purchasing a life annuity is always preserved as the wealth target. However, having enough money to purchase a life annuity cannot be guaranteed, nor is there certainty that insurance carriers will be offering life annuities at a reasonable cost at the exact time an investor needs to purchase one. Since the portfolio in this approach requires constant monitoring (to ensure that enough wealth is available to purchase a life annuity at current prices), it lends itself to an advisor-sold model. This is not always the case for the average participant in an employer-sponsored 401(k) plan—particularly in the automatic enrollment environment promulgated by the Pension Protection Act of 2006.
- **The employer match approach:** A third "program" approach is targeted at employer contributions in 401(k) plans. The proposed solution for generating retirement income is to combine an alpha source and a beta source with deferred annuity purchases over time. The theory behind such an approach is not entirely new—plan sponsors have always had the flexibility to purchase annuities on behalf of their employees with employer match money. Few, if any, did it because it was a more costly alternative than company stock and more complex from an implementation perspective. These two drawbacks have been mitigated in recent years by advances in the insurance and recordkeeping industries. What is "new" in the current industry approach is the combination of multiple moving parts into a single investment vehicle that resembles a target date fund. However, prudence dictates that plan sponsors must still evaluate the alpha and beta sources on their own merits vis-à-vis other target date investment solutions. An integrated combination of "multiple moving parts" may represent simplicity for some plan sponsors but diminish it for others. The lack of portability of this retirement solution when a participant terminates may also be a consideration for some plan sponsors.
- **Target date or balanced fund provided by an insurance company:** The target date fund concept has widespread appeal in the 401(k) industry, and is expected to have continued robust growth. An added benefit to the industry would be the inclusion of a target date or balanced date fund with an income benefit provided by an insurance company would allow the participant to maintain control of the assets during both accumulation and decumulation and would greatly increase the

> utility of this widely accepted investment solution. The guaranteed minimum withdrawal benefit works best for the automatic enrollment target date fund environment because it is simple to explain and understand, while providing the plan participant with an assured level of income in retirement that can only increase, never decrease. It provides participants with flexibility and control inasmuch as they elect to begin paying for the guaranteed option when they are nearing retirement age and not before. It operates like any other investment option on the recordkeeping platform—money can be transferred in/out, and the guarantee can be cancelled at any time if it is no longer needed. If participants terminate employment, the guarantee can remain intact within the 401(k) plan if allowed, or it can be maintained in a non-401(k) IRA rollover vehicle.

The retirement income solution described above also can be offered on a standalone basis to those plan sponsors who have already adopted target date funds in their plan or may not be intending to do so. It can operate independently from a target date program, and requires the plan sponsor to add a single non-target date investment option that has the guarantee.

Why not an asset management product plus longevity guarantee?

So why has the insurance industry not provided longevity guarantees to existing target date funds? The first generation of target date funds do not take the active management of longevity risk into account. Also, the insurance industry has historically been willing to provide the 401(k) market only with *proprietary* longevity solutions. For example, a guaranteed withdrawal benefit will utilize the carrier's own asset allocation models or investment funds (these are typically not target date funds) as the "engine" that drives the longevity guarantee. The primary reason for this is that the carrier completely controls the asset allocation and risk management approach. Hedging a lifetime withdrawal benefit is just easier when all the variables are under the carrier's control. Separating the asset management component from the longevity guarantee is a more recent occurrence in the insurance industry. Carriers are proceeding cautiously, and are providing competitive pricing of the longevity feature only when an external asset manager provides an investment solution with the asset allocation, volatility characteristics, and time-tested risk management techniques that the carrier is comfortable hedging.

Under the right asset management conditions, pricing can be obtained that is significantly less than some other products that provide lifetime income guarantees. When the GMWB is attached to a low-cost collective fund structure, a participant can essentially obtain investment management plus a longevity guarantee for a fee similar or less than an average US equity mutual fund.[1]

Simplicity is the key

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[1] Morningstar Direct 12/31/07 net expense ratio of US domestic all cap equity funds

The key to combining a target date fund to a guaranteed minimum withdrawal benefit is simplicity. The “best” and most comprehensive solution for retirement income is of little value if the benefits department cannot easily explain it and the participant does not understand it.

Participants have to take little to no action to obtain lifetime withdrawals from a GMWB. Each account statement can show a participant what his or her guaranteed withdrawal amount will be at age 65 based on the most recent birthday valuation and any additional contributions made since that time. The participant has peace of mind knowing that at least some portion of fixed expenses in retirement will be covered by the guaranteed minimum withdrawal benefit. The solution also has portability—extremely important with today’s highly mobile workforce. When a plan participant leaves the employer and desires an IRA rollover, he or she can continue the existing guarantee in a non-401(k) investment vehicle.

If we contrast the low percentage of annuity ownership in the US with the high percentage of households that own mutual funds, the data would seem to suggest that the best way to deliver a solution to manage longevity risk is to include it with a familiar investment vehicle. Combine this thinking with the new emphasis on target date funds in collective fund structures, and you have filled the need with a strategy that participants can understand and easily adopt—UBS TargetRetirement Strategies.

SIDEBAR:

Guaranteed minimum withdrawal benefit (GMWB) provides glide path precision
From the plan sponsor perspective, the GMWB feature can allow for greater precision when choosing which of several customized target date fund glide paths to offer plan participants. The guarantee of lifetime withdrawals presents an opportunity to take on more risk in a glide path, thus providing plan participants with an opportunity for greater accumulation of assets.

The plan sponsor also has the flexibility of only putting employer match money into the GMWB investment option . . . thus providing the plan participant with a defined benefit-like payment stream from a defined contribution plan.

SIDEBAR:

Suggested callout from page 1:

- 93% of Baby Boomers said having a guaranteed source of retirement income other than Social Security is important.
- 66% of Baby Boomers are willing to give up 2% in return annually to ensure that their retirement income is guaranteed for life; 75% are willing to give up at least 1% in return annually.

Suggested callout from "Asset Managers: a partial attempt to manage longevity"

Outliving one's assets during retirement has implications that are both statistical and emotional.

Suggested callout from "Simplicity is key section:"

The participant has peace of mind knowing that at least some portion of fixed expenses in retirement will be covered by the guaranteed minimum withdrawal benefit.

BOX:
Key features of UBS TargetRetirement strategies

- "Next generation" target date funds
- Structured to meet the needs of participants and plan sponsors
- Seeks a smother return with less volatility
- Institutional funds with multiple risk profiles
- Optimal risk budgeting approach
- Focuses on managing the four risks of retirement investing:
    - Shortfall risk—not enough savings at retirement
    - Market risk—the volatility of prices
    - Inflation risk—increasing prices outpace savings

- Longevity risk—outliving your savings