

## Structuring Income for Retirement

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is designed to advance knowledge of how proven investment theory and public policy can be put into practice to help Americans invest wisely to meet their financial needs. The Institute calls on resources across Fidelity Investments as well as within the financial services industry and academia to accomplish its mission.

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### Addressing America’s Emerging Guaranteed Income “Gap”

#### INTRODUCTION

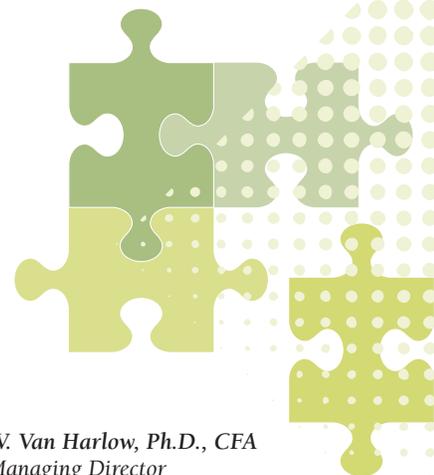
New Year’s Day, 2008, will mark another milestone in America’s growing retirement finance challenge. That is when the oldest members of the Baby Boom generation, those born in 1946, will begin turning 62, the average age for retirement in America today<sup>1</sup>, and become eligible to draw Social Security income.

As all 76 million Baby Boomers cross that same age threshold over the next generation, America’s retirement finance structure will continue a profound, long-term structural change. Traditional sources of “guaranteed” income — Social Security and defined benefit pensions — will replace a smaller and smaller share of pre-retirement income. A guaranteed income “gap” worth many billions of dollars a year will yawn open and widen steadily — into the indefinite future.

Guaranteed income, simply put, is income you cannot outlive. For this reason, it is

also referred to as longevity insurance, since it insures against the possibility of outliving one’s financial resources. Millions of individuals will therefore have to decide how to use their own life savings and investments to create income streams they can’t outlive — insuring themselves against “longevity risk.”

This very predictable challenge is already “baked” into American demographics, law and financial trends. Current Social Security law, for example, mandates both



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steadily rising retirement age eligibility and increasing deductions from future Social Security checks to cover rising Medicare costs. The system is thus on track to replace less than 30% of pre-retirement incomes for retirees by the 2030s — a long, steady fall from today’s 39% replacement rate<sup>2</sup>.

As Exhibit 1 shows, the percentage of private sector active workers covered by defined benefit (pension) plans that provide them with assured income at retirement has been declining dramatically — from 84% in 1979 to just 37% in 2005. This shift has been offset to some degree by the rise of defined contribution workplace savings plans such as 401(k)s, which now reach about 90% of all workers. A critical difference, however, is that workers in defined benefit plans have some of their retirement income planning done for them, in effect, by their employer’s pension fund, which gives them a guaranteed monthly income for life. Workers in defined contribution plans (as well as individual retirement savers in general) must make their own plans for creating — or buying — lifetime income streams.

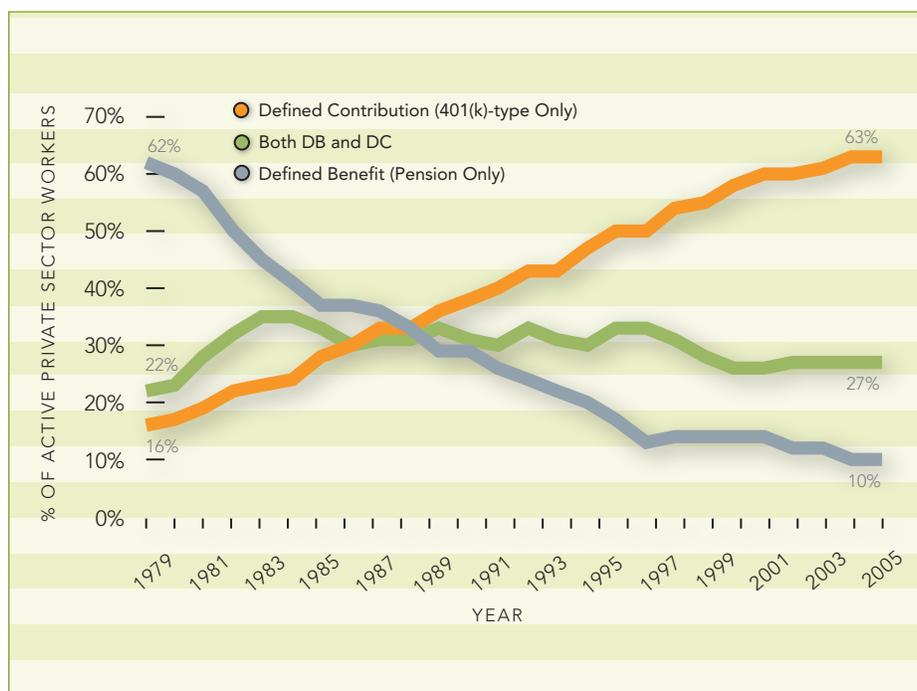
This inevitable decline in guaranteed or “annuitized” income will be offset to some degree by the rising wealth that future retirees are building today in defined contribution workplace savings and individual retirement savings. But even if these savings prove large enough to fill the gap, more and more Americans every year will need to consciously calculate how large a share of their life savings to commit to securing guaranteed income, what investment vehicles to use to meet their income goals, and how they might change the allocation of their remaining “non-annuitized” assets to ensure optimal results.

The purpose of this report is to review these financial challenges and provide new insights into investment solutions that will provide individuals with a solid retirement plan. In particular, this report describes a conceptual framework that addresses the complex interplay between the uncertainty of future investment returns, the uncertainty around life expectancy and the role that guaranteed income can play in helping retirees to achieve a financially secure retirement. We explore ways to structure income for retirement given the tradeoffs among spending rates, retirement risk, and bequest desires.

THIS REPORT  
ALSO ADDRESSES  
THE PSYCHOLOGICAL  
AND BEHAVIORAL  
REASONS THAT  
ACT AS DETERRENDS  
TO ANNUITIZATION  
FOR MANY  
INVESTORS TODAY.

This report also addresses the psychological and behavioral reasons that act as deterrents to annuitization for many of today's investors. The seeming disconnect between the economic arguments in favor of annuitization and the consumer aversion to annuitizing (as evidenced by the relatively small market for annuities) has previously been referred to as the "annuity puzzle" and is an area that requires further understanding by both consumers and financial services providers.

While there is a substantial body of academic research focused on the economic theory associated with annuities, our objective is to provide investors with practical guidance and an improved understanding of structuring income for retirement.



**Exhibit 1**  
**Retirement Plan Trends:**  
**Participation**  
**by Plan Type**

Distribution of Private-Sector Active-Worker Participants, 1979 to 2005

Source: EBRI tabulations of U.S. Department of Labor, Form 5500 Summary Report (Summer 2004); EBRI estimates for 2000 to 2006.

## PART 1

## RETIREMENT INCOME CHALLENGES

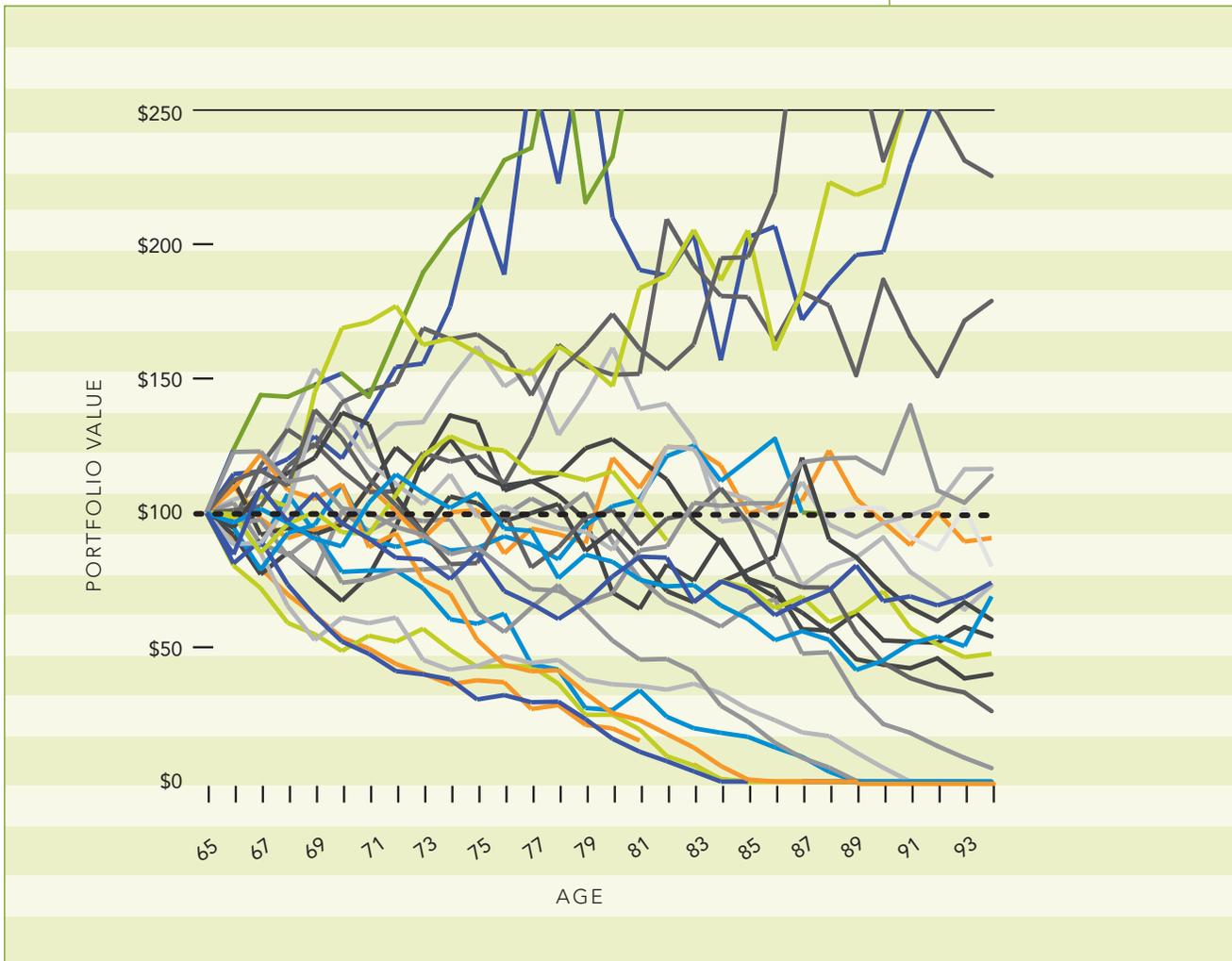
In addition to the structural changes in today's retirement landscape discussed above, retirees are faced with other additional sources of uncertainty that have important consequences for the ultimate success of their financial futures. Among these unknowns are the future returns and risks on investments (market risk) and the uncertainty around the actual length of retirement (mortality risk). We now discuss each of these factors in turn and explore how best to employ asset allocation and guaranteed income in shaping a successful retirement.

Understanding market risk is necessary in order to develop a complete assessment of a retirement plan. To get a sense of the importance of market risk, Exhibit 2 illustrates the enormous variation of investment results that might be realized over time for a typical retirement plan. Each path represents a sequence of asset values that could play out over time. On some paths these investments enjoy extended periods of favorable returns; on others, the portfolio might be sorely impacted by negative market events like the stock market crash of October 1987 or the deflating dot-com bubble from 2000 to 2002.

Understanding **market risk** is necessary in order to develop a complete assessment of a retirement plan.



**Exhibit 2**  
**Market Risk:**  
**Uncertainty of Future**  
**Investment Risk and Return**



Source: Fidelity Research Institute and QWeMA Group Inc., August 2007.  
 Note: The Monte Carlo simulations above are based on a portfolio with 60% stocks and 40% bonds with a real return of 4.4% and a standard deviation of 12%.

But, there are aspects of market risk, other than just dispersion over time, that are equally important to understand in terms of their influence on the success of a retirement plan. The first is unexpected inflation risk and its impact on the future buying power of retirement savings. The second, and less well known, is the “sequence of returns” risk which relates to the path that investment returns take over time and dramatically affects retirement success. Each of these risks are explicitly embedded within the investment return paths that are displayed in Exhibit 2.

**Exhibit 3**

**Inflation Risk: What Does a \$1,000 Payment Really Buy You?**

YEAR	Realized inflation rate during each year...			
	0%	1%	2%	4%
1	\$1,000	\$990	\$980	\$962
5	\$1,000	\$952	\$906	\$822
10	\$1,000	\$905	\$820	\$676
15	\$1,000	\$861	\$743	\$555
20	\$1,000	\$820	\$673	\$456
25	\$1,000	\$780	\$610	\$375
30	\$1,000	\$742	\$552	\$308
35	\$1,000	\$706	\$500	\$253

Source: Fidelity Research Institute and QWeMA Group Inc., August 2007.

**Inflation Risk**

Turning first to inflation risk, Exhibit 3 illustrates the dwindling buying power of savings as they are exposed to differing levels of inflation over extended periods of time. As highlighted in the table, typical retirement periods of 25 years could see as much as a 40% reduction in purchasing power with only modest levels of inflation of 2% (\$1,000 reduced to \$610 in real dollar terms). Keep in mind that inflation is different for retirees than is typically reported since their basket of goods and services is different than a pre-retiree’s.

Securing some degree of protection against the corrosive power of inflation is key to any retirement plan’s probability of long-term success — and generally requires holding a substantial share of equity. Yet, as already discussed, stock market returns are highly variable — and can diverge dramatically under various assumptions. In addition, a somewhat less intuitive aspect of market risk that plays an important role in retirement planning is the sequence of returns.

## Sequence of Returns Risk

Sequence of returns risk revolves around the timing or sequence of a series of adverse investment returns. Exhibit 4 provides a striking illustration. In this example, two portfolios, A and B, each begin with \$100,000. Each aims to withdraw \$7,000 per year. And each experiences exactly the same returns over a 21-year period — only in inverse order — or “sequence.”

Portfolio A has the bad luck of having a sequence of negative returns in its early years and is completely depleted by year 13. Portfolio B, in stark contrast, scores a few positive returns in its early years and ends up two decades later with more than triple the assets with which it began.

**Exhibit 4**  
“Sequence of Returns” Risk

Year	Portfolio A		Portfolio B	
	Return	Balance*	Return	Balance*
0		\$100,00		\$100,00
1	-18.39%	\$75,897	26.57%	\$117,710
2	-19.14%	\$55,710	19.61%	\$132,420
3	-4.59%	\$46,475	5.26%	\$132,017
4	18.47%	\$46,766	16.57%	\$145,733
5	6.79%	\$42,466	33.60%	\$185,347
6	14.30%	\$40,537	21.23%	\$216,210
7	-15.39%	\$28,376	13.92%	\$238,332
8	14.59%	\$24,495	-1.61%	\$227,608
9	8.95%	\$19,060	21.03%	\$267,002
10	19.52%	\$14,414	16.21%	\$302,148
11	20.72%	\$8,951	20.72%	\$356,303
12	16.21%	\$2,267	19.52%	\$417,486
13	21.03%	\$0	8.95%	\$447,225
14	-1.61%	\$0	14.59%	\$504,454
15	13.92%	\$0	-15.39%	\$420,896
16	21.23%	\$0	14.30%	\$473,083
17	33.60%	\$0	6.79%	\$497,730
18	16.57%	\$0	18.47%	\$581,367
19	5.26%	\$0	-4.59%	\$548,004
20	19.61%	\$0	-19.14%	\$437,456
21	26.57%	\$0	-18.39%	\$351,295
Arithmetic Mean:	10.4%		10.4%	
Standard Deviation	14.6%		14.6%	
Compound Growth Rate:	9.4%		9.4%	

\*Starting balance = \$100,000; Withdrawals = \$7,000/year  
Source: Fidelity Research Institute and QWeMA Group Inc., August 2007.

Now that we've looked at two important components of market risk — inflation and sequence of returns — and their potential impact on a retiree's portfolio, let's consider another important source of uncertainty that a retiree must consider when structuring a retirement income plan.

### Mortality Risk

As shown in Exhibit 5, life expectancy among Americans who reach age 65 continues to rise. This is a wonderful trend, but one that poses the challenge of funding those extra years of living expenses. This dramatic increase in life expectancy creates another source of uncertainty for successfully funding retirement.

**Exhibit 5**  
**U.S. Life Expectancy**  
**at Age 65**  
 1940 to 2050



\*Projected values  
 Source: Social Security Administration, Office of the Actuary, September 2004.

Mortality risk is the probability that a person will die at some point in the future. Exhibit 6 shows the probabilities of survival for a healthy 65-year-old male and female. For example, a female who is 65 today has a 56% chance of living until age 85 and 35% chance of living to age 90; for a male, these probabilities are almost 46% and 24%, respectively. Mortality risk is not well understood by today's retirees and pre-retirees which becomes increasingly problematic as Americans are forced to take on more responsibility for generating their own retirement income. A July 2007 Fidelity Research Institute survey revealed that retirees and pre-retirees are significantly underestimating how long they need to make their retirement savings last. The average retiree in the survey estimated that their savings will need to last only until age 85 and the average pre-retiree estimated that their savings will need to last until age 83. These estimates underscore the uncertainty that should be considered in any retirement plan.

Longevity Risk: Probability of Survival at Age 65		
TO AGE	FEMALE	MALE
70	93.9%	92.2%
75	85.0%	81.3%
80	72.3%	65.9%
85	55.8%	45.5%
90	34.8%	23.7%
95	15.6%	7.7%
100	5.0%	1.4%

**Exhibit 6**  
**Many Will Exceed**  
**Life Expectancy**

Source: Society of Actuaries RP-2000 with full projection.

Looking at the probabilities circled in the exhibit for a male, notice that there is an essentially equal probability that a 65-year-old will die before his 70th birthday (100% - 92.2% = 7.8%) or will have 30 years of retirement (7.7%). The fact that the actual length of a retirement period could be 5 years or 30 years dramatically impacts the sustainability of a spending plan.

With this discussion of the risks of inflation, sequence of returns and mortality as background, let's turn to ways to manage the interaction of these risks within a retirement income portfolio.

## PART 2

SOCIAL SECURITY PAYMENTS CAN BE THOUGHT OF AS A FIXED ANNUITY WHOSE INFLATION-ADJUSTED PAYMENTS PLAY A VALUABLE ROLE IN HEDGING INFLATION RISK.

## THE ROLE OF INCOME PRODUCTS IN RETIREMENT PORTFOLIOS

The good news for anyone planning retirement is that a wide array of investments and income products can mitigate the risks we have been discussing and make a successful retirement more likely. Some risks can be completely eliminated or hedged; others, only partially so. Reducing any single type of investment risk, however, almost always involves a tradeoff of another sort. For example, certain types of longevity insurance can reduce the risks associated with living longer but will almost surely reduce potential assets that can be left to heirs.

The risk management challenge for the retiree is to structure or bundle their investment assets and income products in such a way as to reach a personally “optimal” retirement income solution. It is important to realize, however, that the “costs” or “tradeoffs” we will be assessing are not always monetary or “objective.” More often than not they are subjective, reflecting personal choices and values about risk tolerance, emotional comfort or the desire to leave assets to heirs.

To capture the essence of retirees’ risk management challenges, we will limit ourselves to assessing combinations of three basic building blocks that can form complete retirement income portfolios:

- Lifetime Income Annuity (LIA) with fixed or variable payments
- Variable annuity with guaranteed living income benefits for life, e.g., a Guaranteed Minimum Withdrawal Benefit (GMWB)
- Traditional Systematic Withdrawal Plan (SWP) with investments in stocks, bonds and cash

The first option, a LIA, is the well-known annuity that provides lifetime payments to the purchaser. Most annuities have variable payments or fixed nominal payments but some do offer inflation-adjusted payments (fixed real payments), typically for additional fees. Social Security payments can be thought of as a fixed annuity whose inflation-adjusted payments play a valuable role in hedging inflation risk. Fixed payment annuities provide the highest level of longevity insurance.

The second investment option, the variable annuity with income guarantees, also provides some longevity insurance. The version we will discuss here, however, also offers a guaranteed minimum withdrawal benefit for life or GMWB, which provides a minimum assured payment for the lifetime of the purchaser. In addition, because this option allows for allocations to stocks and bonds within the variable annuity contract, it can provide some hedge for inflation risk.

Finally, the Systematic Withdrawal Plan is the traditional way of self-funding retirement through a strategic asset allocation to stocks, bonds and cash. This bucket may contain a variety of investment products, including mutual funds, bond ladders and other products. The retiree draws from this portfolio “systematically” — generally a percent of the total assets per time period — while maintaining their chosen asset allocation mix.

By definition, this option provides greater liquidity and access for withdrawals and income than do the other two options. It also has higher growth potential. However, there is no insurance element in a traditional SWP — and hence no explicit protection for longevity risk or for poorly performing markets.

Each of the three investment options plays a different role within a portfolio designed to provide structured income in retirement. Each possesses characteristics for partially or fully hedging various retirement risks but with different costs and tradeoffs.

Exhibit 7 attempts to illustrate these tradeoffs using a qualitative ranking convention of low, medium, and high. Note that the ranking assigned to each product attribute are illustrative only.

**Exhibit 7**  
**Features and Conceptual**  
**“Scores” for Various**  
**Income Options**

	Risk-Management Attributes			Goal-Achievement Attributes			
	Sequence of Returns			Liquidity	Behavioral	Estate	Ongoing Fees & Expenses
	Inflation	Longevity					
<b>LIA</b> (Lifetime Income Annuity)	LOW	MED	HIGH	LOW	HIGH	LOW	-LOW
<b>SWP</b> (Systematic Withdrawal Plan from Investments)	HIGH	LOW	LOW	HIGH	LOW	HIGH	-MED
<b>GMWB</b> (Any Variable Annuity with Guaranteed Living Income Benefits)	MED	HIGH	MED	MED	MED	MED	-HIGH

Source: Fidelity Research Institute and QWeMA Group Inc., August 2007.  
 Note: The low, medium and high scores provide a qualitative ranking of the ability of each category of investment or product to meet a specific need.

The resulting table compares the risk-management attributes of the options — inflation, sequence of returns and longevity. It also provides simple characterizations of how well these options meet personal preferences for liquidity, behavioral and estate goals. “Liquidity” refers to the ability to easily convert an asset to cash with minimum loss of value, while “Estate” refers to leaving a financial legacy to heirs or beneficiaries upon one’s death. Each individual places a different level of importance on these attributes or goals. “Behavioral” refers to a range of subjective benefits such as degree of risk tolerance and the peace-of-mind insurance coverage can provide, which are also unique to each individual.

Looking at the first column of the table labeled “Inflation,” the investment option with the highest score for hedging inflation risk is the SWP. The lowest score is the LIA (assuming it is not an inflation-adjusted annuity). In the next column, the best investment for mitigating “Sequence of Returns” risk is an income product like the GMWB and the worst is the SWP (with no insurance). The LIA provides the best insurance against “Longevity” risk while the SWP provides none. (It is important to point out Social Security benefits hedge both longevity risk and inflation risk.)

In terms of personal preference attributes, the SWP provides the best liquidity since the retiree has direct access and control of the investments. The LIA (fixed annuity) scores high from a behavioral perspective since it is providing a fixed payment every month regardless of the performance of the stock and bond markets. For maximizing the value of the estate, the SWP is the clear winner, since it has the largest potential investment “upside” and the investor maintains control of the assets.

Finally, scoring the investment options based on their “Ongoing Fees and Expenses” (high denoting the highest fees and expenses), the LIA can be thought of as having the lowest because, once purchased, there are no additional future expenses affecting the “performance” of the payment. This is not meant to imply that the LIA has no upfront fees associated with it because, of course, it does, and these fees reduce the payment amount. However, for planning purposes, the payment is known with certainty, so in terms of ongoing fees, we assign it a low ranking. The GMWB has higher fees than the SWP because, in addition to the expenses related to the investments within both options, the GMWB has the additional fees related to the insurance (longevity and market) that it is providing.

The point of this illustrative matrix is that no one investment option absolutely dominates the other. Instead, the attractiveness of each option varies based on the individual retiree’s weighting of the peace-of-mind that the insurance protections provide versus asset and estate growth potential.

Ultimately, this balance can be characterized as a tradeoff between the sustainability of retirement funding and the desire for bequest to heirs. It is to this balancing act that we now turn our attention.

## THE RETIREMENT SUSTAINABILITY QUOTIENT

The word “sustainability” raises what is arguably the greatest fear for most retirees and those planning on retiring soon. That is the risk of either running out of money entirely (apart from Social Security) or running so low that it is impossible to sustain comfortable or desirable levels of income and consumption beyond the “safety net” income of Social Security. Mitigating the risk of falling far below desired retirement income levels is certainly a measure used in many financial planning tools that assess the probability of various withdrawal rates from different securities portfolios “succeeding” or “failing.”

But as we also weigh the possible role of income products like the LIA and the GMWB in a total retirement income portfolio mix, we need to develop a richer, more subtle range of possible outcomes and tradeoffs around the retirement income goal. That’s because certain income products have a greater ability than others to raise the baseline level to which a retiree’s income can fall. Even if a shortfall occurs, it could, for example, be just a few dollars per month short of funding goals or it could be severe enough to move a plan towards a complete exhaustion of retirement savings.

A potentially useful measure of the likelihood of a given mix of income products and assets to provide the desired retirement income spending over time might be defined as a Retirement Sustainability Quotient or RSQ. The following equation provides a simple model of the complex mathematics of investment and mortality risk that could determine a given retirement plan’s chances of delivering sustained consumption at a desired level.

## PART 3

Using this RSQ concept,  
it would be possible to assess  
how different mixes of products  
and assets affect a given plan’s  
**chances of success or failure**  
over time.



$$RSQ = \frac{C_{LIA}P_{LIA} + C_{GMWB}P_{GMWB} + C_{SWP}P_{SWP}}{C}$$

Here, the numerator includes three potential sources of income to fund consumption in retirement: the share of consumption provided by a lifetime annuity over the mortality-weighted retirement period ( $C_{LIA}$ ); the same measure of income from a GMWB ( $C_{GMWB}$ ); and third, the consumption provided by systematic withdrawals from assets ( $C_{SWP}$ ). Each of these sources of income is multiplied by its respective probability of successfully providing their level of funding (denoted  $P$  with the appropriate subscript).

The denominator “ $C$ ” is the desired level of consumption (expenditures) in retirement. Dividing the three sources of income by this desired level determines any given retirement plan’s RSQ. Using this RSQ concept, it would be possible to assess how different mixes of products and assets affect a given plan’s chances of success or failure over time. So, for example, an RSQ of 90% means the given combination of annuity income, GMWB income and income from assets should provide 90% of the desired funding over the expected duration of that person’s retirement. All other things being equal, the higher the RSQ — the better.

It is probably worthwhile to contrast the RSQ measure with the more traditional probability-based measure of sustainability based on withdrawal or spending rates. With the latter approach, the probability of successfully funding a specific retirement period is determined with the goal to choose a spending rate that achieves a comfortably high probability of funding your entire retirement (e.g., 90%). This probability is much like the  $P_{SWP}$  term in the equation for RSQ provided above. However, the probability of success does not capture any sense of severity. You might fall short by \$1 at the end of your retirement horizon or completely run out of money 15 years too early. In either case, your retirement was unsuccessful by this measure.

The RSQ measure, on the other hand, provides a broader view of the sustainability of a retirement plan. It explicitly captures the average potential of under funding your desired level of consumption. This is a more meaningful and useful metric when evaluating portfolio allocations that include income products because it captures the fact that you may be receiving some income through longevity insurance.



**Exhibit 8**  
**The Retirement Income/  
 Bequest “Frontier”**

Source: Fidelity Research Institute and QWeMA Group Inc., August 2007.

Note: Each point along the frontier represents both a different asset allocation as well as a different income product allocation. Higher RSQ values are associated with higher allocations to income products.

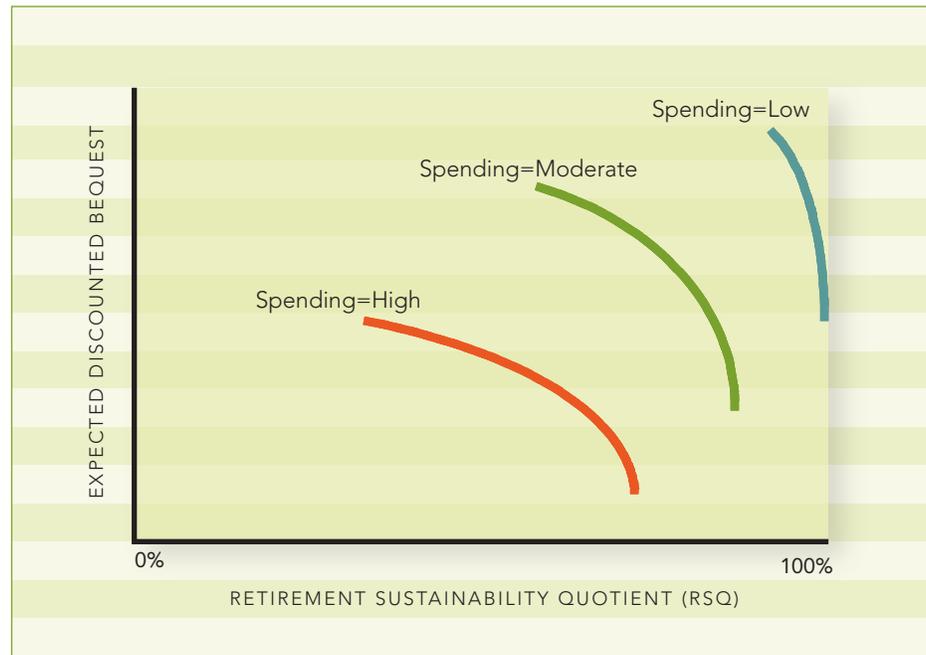
Exhibit 8 illustrates how the tradeoffs between expected discounted bequest to heirs and our new notion of the sustainability of retirement income combine in practice to form a conceptual “frontier” reflecting the tradeoffs between larger and smaller potential bequests to heirs and beneficiaries and higher or lower likelihoods of sustaining desired consumption in retirement. We are using the term “expected discounted bequest” because it captures the uncertainty of the bequest amount given market risk and mortality risk. Each point along the frontier represents both a different asset allocation as well as a different income product allocation in order to achieve a particular combination of bequest and sustainability.

In this example, we assume that a retiree has moderate levels of spending in retirement — roughly 4% to 5% of their total retirement portfolio per year for a 65-year-old. Keep in mind that this level of spending may not provide the degree of sustainability that is desired by the retiree. Rather, it is a point of reference for our discussion.

The first key point to note is that retirement funding risk, as measured by RSQ, can be decreased — that is moved to the right on the curve. This gain in RSQ would be achieved by converting larger and larger shares of liquid assets into LIAs or GMWBs that provide increasing levels of longevity insurance and higher guaranteed income throughout the retirement period.

**Exhibit 9**  
**Expected Discounted**  
**Bequest and Retirement**  
**Income Risk**

At Various Target  
 Spending Rates



Source: Fidelity Research Institute and QWeMA Group Inc., August 2007. Note: Each point along a frontier represents both a different asset allocation as well as a different income product allocation. Higher RSQ values are associated with higher allocations to income products.

But this movement to greater sustainability comes only at the cost of a substantially smaller potential bequest to heirs (moving downward along the curve). Retirees themselves must decide where along this “bequest frontier” they are comfortable, given their overall goals and the remaining risks they must also manage.

In order to get a broader sense of the structured income tradeoffs available to a retiree, Exhibit 9 displays a series of bequest frontiers for different target spending rates. For our purposes here, a low spending rate can be thought of as one that provides high sustainability, for example, less than a 4% withdrawal rate for a 65-year-old. Moderate spending can be thought of as 4% to 5% and high spending would be greater than 5%. One of the first things to notice is the intuitive relationship between spending rates and the sustainability of retirement funding. With higher spending rates comes a lower likelihood of achieving the desired level of consumption throughout retirement. Notice that higher spending rates are also associated with lower discounted bequest levels.

Another important insight from Exhibit 9 is the role that guaranteed income products play when a retiree has low spending rates.

Looking at the low spending curve in the graph, it is apparent that whatever the optimal portfolio combinations of the LIA, GMWB and SWP, the RSQ is high all along the curve. For all combinations, then, low-withdrawing retirees can be confident that their desired level of consumption is more likely to be achieved.

Moving down the curve using more longevity insurance does improve the RSQ — marginally. But these slight improvements in sustainability come with a very high price tag in terms of a much smaller potential bequest.

Thus, for retirees confident of being able to meet their needs with low withdrawal rates from their assets, buying added longevity insurance probably doesn't make much sense.

By contrast, retirees with moderate withdrawal rates and those with relatively high withdrawal rates can substantially increase the sustainability of their retirement incomes by purchasing guaranteed income products and sacrificing potential bequest amounts.

The coming retirement of the Baby Boom generation will bring a hidden challenge into full visibility: How best can future retirees structure their portfolios to manage and mitigate the risks of inflation, mortality, and the market, while achieving their goals for liquidity, bequest and other personal preferences?

As the Boomers move from accumulation to lifelong income draw-down, the need for research, product development and bold, paradigm-breaking thought on lifelong income provision grows more urgent every day.

Indeed, integrating longevity/mortality risk with investment and asset allocation risks and then creating truly “optimal” solutions is arguably the most important “thought frontier” for financial services in America. We are nowhere near exhausting the scope of innovation that today's markets and technology can support.

Financial service providers should compete by developing new and transparent lifetime income solutions that answer more and more of the legitimate complaints that investors have about the complexity, high cost, and inflexibility that have limited the appeal of traditional annuities.

But even as this work goes on, existing income products can and should be used — right now — to help retirees create retirement portfolios that can significantly increase their likelihood of sustained lifelong income.

Here are several guidelines that we believe should be applied:

- 1) Structuring an income plan to successfully fund retirement involves not only considering traditional asset allocation across stocks, bonds and cash, but also potentially “product allocation” across income products offering longevity insurance, inflation protection and payment guarantees.

## CONCLUSIONS

### 5 Guidelines

INTEGRATING  
LONGEVITY/MORTALITY  
RISK WITH INVESTMENT  
AND ASSET ALLOCATION  
RISKS AND THEN  
CREATING TRULY  
“OPTIMAL” SOLUTIONS  
IS ARGUABLY THE MOST  
IMPORTANT “THOUGHT  
FRONTIER” FOR  
FINANCIAL SERVICES IN  
AMERICA.

- 2) Allocation across assets and income products within a retirement income plan involves the careful consideration of the tradeoffs between the risk protections offered by income product features, such as guaranteed lifetime income and inflation protection versus the maximization of estate values (i.e. bequest goal), liquidity, investment control and cost.
- 3) Individuals who can secure adequate retirement income at low rates of withdrawals from assets may find that any additional protections offered by longevity insurance and payment guarantees are not attractive from a cost/benefit perspective. Such individuals already have a high likelihood of successfully funding their retirements.
- 4) Individuals with higher spending requirements may find a beneficial role for income products with certain risk-protection features.
  - This is especially true in cases where there is no or a minimal estate bequest goal. Here, fixed annuities offer an attractive protection benefit.
  - For cases with higher bequest goals, variable annuities with GMWB features and traditional asset SWPs are more attractive.
- 5) In developing a structured income plan for retirement, the financial tradeoff for higher income and/or higher bequest goals is a lower likelihood of success. In addition, optimized portfolios associated with higher income requirements and/or higher bequest goals tend to include larger allocations to variable annuities with GMWB features and traditional asset SWPs, all things being equal.

An annuity contract is a way of converting savings into a pension-like income for life, or for a specified period of time. It is a financial product that provides for a series of periodic payments. If the payments start shortly after purchase, it is called an income annuity. If the payments start later, it is a deferred annuity. Most annuity contracts are issued by insurance companies, although some are issued by charities and others are purchased in private transactions.

Whether income or deferred, an annuity contract can be fixed or variable. A fixed deferred annuity provides a guaranteed rate of return before annuity income payments begin, and a fixed payment stream afterward. A fixed income annuity provides a fixed payment stream starting shortly after it is purchased. A variable deferred annuity provides growth potential based on the performance of assets selected by the purchaser, both before and after income payments begin. An annuity contract need not be fixed or variable for its entire life. A deferred annuity contract might be variable before income payments start and fixed afterward, or vice versa.

The chart below outlines the different types of products and for whom they may be most appropriate.

	What does it provide?	For Investors who are:
<b>Deferred Annuity</b>		
<b>Deferred Variable Annuity</b>	Tax-deferred savings with growth potential	1) Looking for an additional tax-deferred way to save for retirement. 2) Comfortable with potential earnings that will fluctuate based on performance of the investments selected.
<b>Deferred Fixed Annuity</b>	Tax-deferred savings with a guaranteed fixed rate of return	1) Looking for tax-deferred investments that offer protection from market volatility.
<b>Income Annuities</b>		
<b>Variable Income Annuity</b>	Guaranteed lifetime income payments with growth potential to help keep pace with inflation	1) Looking for income that has the potential to grow over time. 2) Can withstand fluctuations in their income based on the performance of the investments selected.
<b>Fixed Income Annuity</b>	Guaranteed lifetime income with pension like steady payments	1) Looking for a guaranteed income stream.

### Annuity Features and Guarantees

In addition, there are a range of other contract features which can be used to tailor annuity products to meet individual needs. Often, these features are provided for additional fees. Some of these features include:

- **PERIOD CERTAIN GUARANTEE.** Payments are guaranteed for at least a certain number of years.
- **SURVIVORSHIP BENEFIT.** A feature that will ensure the annuity continues to pay out to a spouse or other beneficiary after the death of the annuitant for as long as the spouse/beneficiary survives.
- **INFLATION INDEXED PAYMENTS.** To help negate the negative impact of inflation on future income, payments are adjusted based on the consumer price index.
- **GUARANTEED MINIMUM WITHDRAWAL BENEFIT.** A guarantee of a minimum payment stream for life with growth potential to increase future payments. The benefit often can be purchased for a set number of years or for the life of a joint beneficiary who survives, so that there is some ability to leave a bequest.

### Investment Returns, Mortality Credits and “Longevity Bonuses”

Annuities have a basic investment return element essentially similar to “tontine” contracts, which date back to the Middle Ages. Consider an example in which five 95-year-olds decide to form a contract (a tontine) in which each of them will contribute \$100 to a common investment pool. They invest the funds in a bank at 5% interest. At the end of the year, those individuals who are still alive split the assets.

It so happens that the probability that a 95-year-old will die in the upcoming year is approximately 20%. Thus, on average, we could expect only four of the five 95-year-olds in the tontine to survive until the end of the year to split a pool of assets that will have grown to \$525 (\$500 of original capital plus \$25 in interest).

Each surviving individual thus receives \$131.25 (\$525 divided by four) for a return on the original \$100 of 31.25%. Only a small fraction of this return — 5% — is from the bank’s interest. The bulk of it, — 26.25% — is from what insurers call “mortality credits” — that is, added returns to surviving pool members from the assets of pool members who have died. A more positive term for these returns might be “longevity bonuses.”

In essence, this is the same way returns are generated for purchasers of annuities today — and it explains their unique investment benefits for those individuals who do, in fact, win the inherent longevity “bet” built into any annuity contract. Longevity bonuses do effectively subsidize any losses on investments held by the annuity pool and further enhance any investment gains — for those who remain living.

Longevity bonuses thus ensure that the survivors will achieve higher returns on exactly the same pattern of investments than they could receive on the same investment held individually because they participated in a pool. Of course, the converse is also true.

Those who lose the longevity “bet” inherent in annuities forfeit their assets to other members of the pool (not to the insurance company, but to fellow annuitants). But even those who “lose” assets to the pool by passing away earlier, will have received the subjective benefit of having longevity insurance coverage while they were alive. And that is a subjective benefit they would not have had from any individually-held investment portfolio.



Regardless of whether an annuitant “wins” or “loses” the bet on living longer than the average participant in the contract’s pool, there is another possible benefit to consider. Namely that having a substantial share of retirement consumption financed by a guaranteed income product may enable a retiree to tolerate more equity risk and volatility in the assets they hold outside of the annuity — and thus have the possibility of securing higher total income or a larger bequest from market growth. Academic research also shows that having a secure, longevity-insured source of income justifiably induces retirees to take on more stock market risk with their other assets. (See M.A. Milevsky (2006), [A Gentle Introduction to the Calculus of Retirement Income](#), Cambridge University Press.)

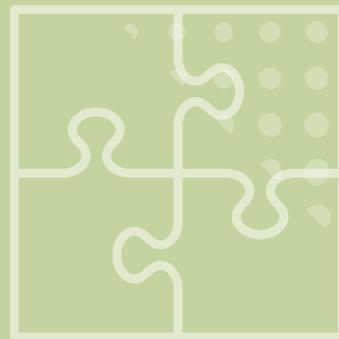
#### **Is the annuity “puzzle” really all that surprising?**

As we’ve seen, the potential longevity bonuses inherent in annuities provide a uniquely positive support for investment returns provided a participant lives beyond the average life expectancy of fellow pool’s members. What’s more, considerable academic research shows that having a secure, guaranteed income stream has a positive financial and psychological impact on retirees’ well-being. Yet most people still choose to manage a lump sum on their own rather than purchase an income annuity when it comes to structuring their retirement assets.

This “annuity puzzle” has long been a topic of financial and academic research. Among the reasons hypothesized as barriers to annuitization are: The desire to leave a legacy, the complexity of annuities and lack of financial literacy among consumers, an aversion to a perceived loss (i.e. if I die early, I lose), and a desire to maintain control over one’s financial future, to name a few.

To shed fresh light on the puzzle, a new Fidelity Research Institute survey of pre-retirees and retirees found that there are myriad barriers to annuity adoption, some based on emotion and some on logic, but each is potentially solvable by improved investor education. Some key findings from the survey:

- Retirees and pre-retirees voice multiple and varied concerns about annuities. In particular, for those approaching retirement, the greatest barriers include: a desire for more flexible access in terms of withdrawals; continued investment growth to protect against inflation and outliving savings; and control over their assets. Pre-retirees are also especially concerned about the fees and expenses associated with annuities.
- For those already retired, the greatest obstacle is tied more to their satisfaction with their existing income sources of pensions and Social Security, with four-fifths of retirees believing they already have enough guaranteed income in retirement. However, as Social Security and traditional pensions both decline in terms of their future ability to replace pre-retirement income, future retirees will likely be more amenable to annuities to help sustain — or recreate — the levels of guaranteed income today’s retirees enjoy.



- Gaps in investor education and planning could also be contributing to the underutilization of annuities, particularly on the topics of longevity and overall income planning. According to the Institute’s survey, retirees believe they will need to make their retirement savings last until an average of age 85; for pre-retirees, the average estimate is even younger at age 83. These estimates highlight how many pre-retirees underestimate their life spans, and therefore risk outliving their assets, given the likelihood of living to at least 90 for men (24%) and women (35%) who have reached age 65.
- One-third (35%) of retirees admit that they do not currently know how much they can afford to spend each month to prevent outliving their savings (this percent increases to over half when including those who made a “mental calculation”). For these retirees, the most popular reported income planning strategy is simply to “live as they did before retirement and make adjustments later if necessary.”
- One-half of pre-retirees and nearly as many retirees would agree that they do not know enough about annuities or their benefits in order to make a decision to purchase.

In addition to outlining the major barriers to annuity adoption, the Institute’s survey findings also identified trends that point to a potential increase in the importance and/or acceptance of annuities as an income source for future generations of retirees:

- The importance of leaving a financial legacy (a potential barrier to annuity adoption) may be overstated or decreasing due to the increasing personal financial burden being placed on upcoming generations of retirees. Current retirees are more willing than future retirees to live on less in order to leave more to their heirs (32% of retirees vs. 13% of pre-retirees). Coming generations of retirees may thus be more amenable to annuity solutions.

Barriers to Annuity Adoption	Retiree	Pre-Retiree
Want more flexibility on withdrawals	72%	<b>84%</b>
Need my savings to grow	72%	77%
Don’t want to give up control	70%	75%
Not comfortable with big irreversible decision	64%	64%
Don’t want to touch my savings until I have to	60%	67%
Fees/expenses too high	52%	<b>69%</b>
Already have regular income coming in	<b>80%*</b>	54%
Worried income won’t keep up with inflation	42%	<b>62%</b>
Won’t get money back that I put in, risky	43%	<b>55%</b>
Don’t know enough about them	44%	50%
Don’t trust them	44%	46%

Source: Fidelity Research Institute, August 2007.

\* Most often cited as the primary barrier by retirees (there is no single primary barrier that stands out for pre-retirees). Bold indicates statistically significant difference between retirees and pre-retirees.

- A significant group of retirees and even more pre-retirees are questioning the “guarantee” of traditional sources of “guaranteed” retirement income (Social Security and workplace pensions). Less than two-thirds (65%) of retirees (and just over half of pre-retirees) consider the income from employer pensions guaranteed throughout retirement, and nearly one-fifth of retirees and pre-retirees are uncertain about Social Security’s “guarantee.”
- Three-quarters (75%) of pre-retirees and more than half (52%) of retirees express concern about the impact of market fluctuations on their retirement savings. The guarantees offered by annuity payments could potentially relieve some of that concern.
- One-third of pre-retirees (35%) would be willing to give up control of some of their assets for an income guarantee and two-fifths (41%) would be willing to pay a reasonable fee for a guarantee.
- Overall, future retirees are less likely than current retirees to have guaranteed income sources available to them and are more concerned about outliving their savings (53% of pre-retirees vs. 29% of retirees), making them potentially better suited for annuity income and the guarantee it can provide.

As these research findings confirm, the annuity “puzzle” is actually not very puzzling at all.

There are very real, and in many cases, rational reasons why many will reject the necessary tradeoffs required to secure guaranteed income in retirement.

Currently, the tradeoffs presented by many guaranteed income products are too complex, and the deterrent to purchase is exacerbated by the weight of an irreversible decision.

Until the importance of guaranteed income is more effectively communicated and its benefits to specific financial situations clearly demonstrated, investors’ willingness to consider or purchase annuities and other income products will increase only at a measured pace. Growing consideration and acceptance of income products will, however, be driven — for decades to come — by the emergence of a guaranteed income “gap” that investors are only now beginning to see ahead of them.

The Fidelity Research Institute welcomes comments and questions about its research findings and papers, however, it cannot provide advice or guidance regarding individual situations. For questions about your Fidelity account or workplace savings plan, please call the customer service number or visit the web site indicated on your account statement.

<sup>1</sup> Employee Benefit Research Institute, 2005 Retirement Confidence Survey (EBRI Issue Brief No. 280, p.5).

<sup>2</sup> “The Declining Role of Social Security.” Just the Facts No.6, 2003. Center for Retirement Research at Boston College.

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## END NOTES



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