# THE NEXT EVOLUTION IN DEFINED CONTRIBUTION RETIREMENT PLAN DESIGN

## A Guide For DC Plan Sponsors To Implementing Retirement Income Programs


By Steve Vernon, FSA
Consulting Research Scholar, Stanford Center on Longevity

Stochastic analyses by Dr. Wade Pfau
Professor of Retirement Income
The American College

Fiduciary discussion by Fred Reish, Bruce Ashton,
and Joshua Waldbeser
Drinker Biddle & Reath LLP



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***Society of Actuaries Committee on Post-Retirement Needs and Risks***
The Society of Actuaries is an educational and research organization for actuaries. The Society of Actuaries would like to acknowledge the work of its Committee on Post-Retirement Needs and Risks for its role in this research. The Committee's mission is to initiate and coordinate the development of educational materials, continuing education programs and research related to risks and needs during the post-retirement period. Individuals interested in learning more about the committee's activities are encouraged to contact the Society of Actuaries at 847-706-3500 for more information. Additional information and research reports may be found at www.soa.org.

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# INTRODUCTION

Older workers approaching retirement face significant challenges with managing their retirement savings to generate reliable lifetime retirement income. The consequences of failing for U.S. retirees are severe — exhausting savings during retirement, relying solely on Social Security, and living in poverty or near-poverty.

Employers and retirement plan sponsors are in an advantageous position to help their retiring employees meet these challenges by implementing a retirement income program in their defined contribution (DC) retirement plans. Such a program would offer one or more retirement income generators (RIGs) that convert their employees' savings into lifetime retirement income, communications support to help retiring employees make informed decisions about generating retirement income, and administrative support to help implement those decisions.

This paper is intended to help plan sponsor fiduciaries understand existing options and carry out their due diligence when studying retirement income solutions for DC retirement plans. It educates human resources and financial professionals at plan sponsors about the potential issues, solutions, and processes involved with implementing, administering, and communicating a retirement income program for their plan participants.

The primary goal of this paper is to help retirement plan sponsor fiduciaries and managers make informed decisions about implementing income solutions that will improve the financial security of their plan participants in retirement. It is not intended to provide legal advice to plan sponsor fiduciaries and managers.

We would like to thank the Society of Actuaries' Committee on Post-Retirement Needs and Risks (CPRNR) for its role in envisioning this project and providing guidance and support to conduct the research and quantitative analyses and write this paper.

# SECTION ONE: EXECUTIVE SUMMARY

The long-term shift from traditional pensions to defined contribution and hybrid defined benefit plans places significant responsibility and challenges on retirees to successfully generate lifetime retirement income. For example:

- Given improvements in life expectancies, the money set aside for retirement may need to last a long time — potentially 20 to 30 years or more. But many retirees are not prepared to manage this critical task on their own. Furthermore, there's much uncertainty around how long an individual retiree will actually live.

- Market volatility complicates the challenge of managing savings in retirement. Since 1987, there have been four major market meltdowns. With retirements potentially lasting 20 to 30 years or more, it's prudent for retirees to expect and plan to survive more meltdowns in their future.

- Many employees don't know how to calculate the amount of savings that's needed to generate lifetime retirement income. They often guess at this amount, and usually they guess too low. This results in retirements sooner than financially prudent based on the amount of retirees' savings.

- There's also evidence that retirees are doing a poor job of managing retirement risks; many lack a formal plan to generate retirement income from their savings, and as a result, they're planning to spend down assets at an unsustainable rate. Others are under-spending in retirement for fear of running out of money. Surveys show that employees and retirees want and need help generating retirement income.

The fact is, retiring employees face a daunting challenge when deciding how to deploy their savings to generate retirement income. They need to address a number of risks, including:

- market risk,
- longevity risk,
- inflation risk,
- cognitive risk,
- health risks,
- property risk (such as expensive house repairs),
- the risk of receiving poor, expensive, and/or biased advice,
- the risk of fraud, and
- the risk of making mistakes.

In addition to addressing these risks, retirees must make decisions about deploying their savings in the context of other important retirement decisions and considerations, including:

- claiming Social Security benefits,
- the existence of traditional pension benefits,
- deploying home equity,
- the role of continued work in retirement, and
- addressing the threat of high expenses for medical and long-term care.

It should be no surprise that retirees might want and need help making these critical decisions from someone they can trust.

Robust retirement income options aren't widespread among defined contribution plans. The primary reason is how plan sponsors view their defined contribution plans; according to one study,[1] 91% view them as savings plans, while only 9% view them as vehicles for providing retirement income. A cultural shift is needed: Employers and plan sponsors need to commit to operating their plans as true retirement plans.

Several financial institutions currently offer a diverse set of retirement income solutions, yet the alternatives are still evolving. Each retirement income solution has its pros and cons, and the amount of retirement income delivered to retirees depends significantly on their choice of a retirement income generator. Because there's no "one size fits all" retirement income solution, retirees will need to make calculated tradeoffs when considering the amount of retirement income they need based on their individual goals and circumstances. Understanding the issues involved with generating retirement income is critical for plan sponsors when deciding which retirement income solutions are best for their plans and employees.

Employers and plan sponsors may have a number of goals regarding implementation of a retirement income program, including minimizing fiduciary exposure and administrative complexities, while meeting the retirement planning needs of their employees and improving their security and satisfaction.

It is important to recognize that most plan sponsors do not have the desire, ability, or resources to directly deliver retirement planning advice to their employees, and this paper does not advocate that goal. Instead, plan sponsors can create an environment that will facilitate effective retirement planning by offering a robust retirement income program.

There are many potential reasons a retirement plan sponsor may want to implement a retirement income program in its defined contribution retirement plan:

- Improve the likelihood that retirement plan assets will do what they were intended to do, i.e., improve retirement security
- Retain assets in the plan, which can help drive down per-capita administrative costs
- Implement a low-cost yet valuable benefit improvement
- Enable workforce succession by helping older workers retire "gracefully," thus improving productivity and morale
- Enhance the employer brand as a desirable place to work
- Be a good corporate citizen — it's the right thing to do for employees

Plan sponsors and employers are uniquely positioned to help their retiring employees generate retirement income from their savings:

- Plan sponsors have the resources to carry out due diligence to offer retirement income solutions that provide reliable, lifetime income, meet various goals regarding protection from common risks, and minimize transaction costs and conflicts of interest.
- By providing institutional pricing, plan sponsors can significantly increase the amount of retirement income that participants might receive.
- They don't have any economic incentive that might bias the design of a retirement income program.
- Some retirees may be served best by choosing a combination of retirement income generators. Plan sponsors can help by offering a limited menu of options with the ability to combine retirement income generators and/or a few packaged solutions that combine different solutions and are designed to meet common goals and circumstances.

- Plan sponsors can improve retirees' decision-making with unbiased communications and tools on generating retirement income.
- Plan sponsors can help overcome inertia by facilitating the implementation of employees' decisions.

A properly designed, robust retirement income program with the above features can make a significant difference regarding the critical issue of generating reliable retirement income from savings. This issue affects employers, plan sponsors, workers, and our society as a whole. This paper encourages plan sponsors to implement a retirement income program and presents a guide for implementing such a program.

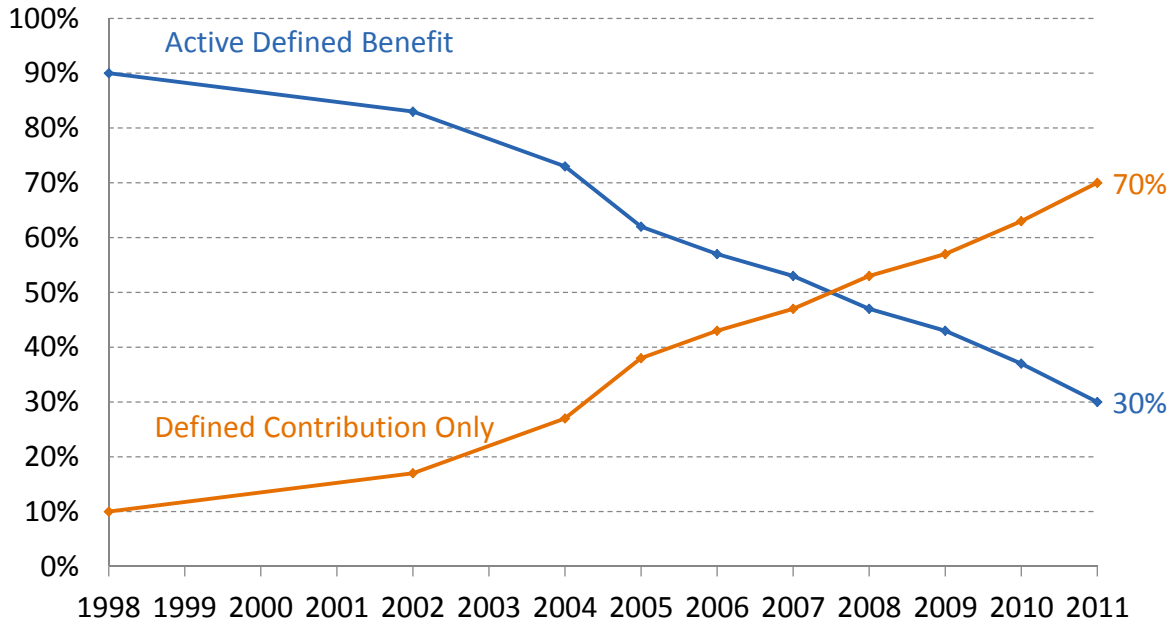
# SECTION TWO: DEFINING THE PROBLEM

***The long-term shift from traditional pensions to defined contribution and hybrid plans places significant responsibility on retirees to successfully generate lifetime retirement income.***

A traditional defined benefit pension plan pays a retiree a monthly income for life, no matter now long the retiree lives and no matter what happens in the economy. The plan sponsor assumes investment risk and pools longevity risk among all plan participants. The amount of retirement income doesn't depend on decisions made by employees; it depends primarily on plan formulas based on service and earnings. In addition, the Pension Benefit Guaranty Corporation (PBGC) provides some guarantees if the plan sponsor is unable to fulfill its commitments.

Defined contribution and hybrid defined benefit plans, such as cash balance plans, typically pay a lump sum upon retirement. Retirees assume the risk of deciding how much to save and how to deploy that money in retirement, as well as the risk of outliving their retirement savings due to extended lifespan, investment volatility, and other critical challenges.

**Figure 2.1 Percentage of Fortune 100 Employers Offering DB and DC Plans to New Hires, 1998-2011, Select Years[2]**

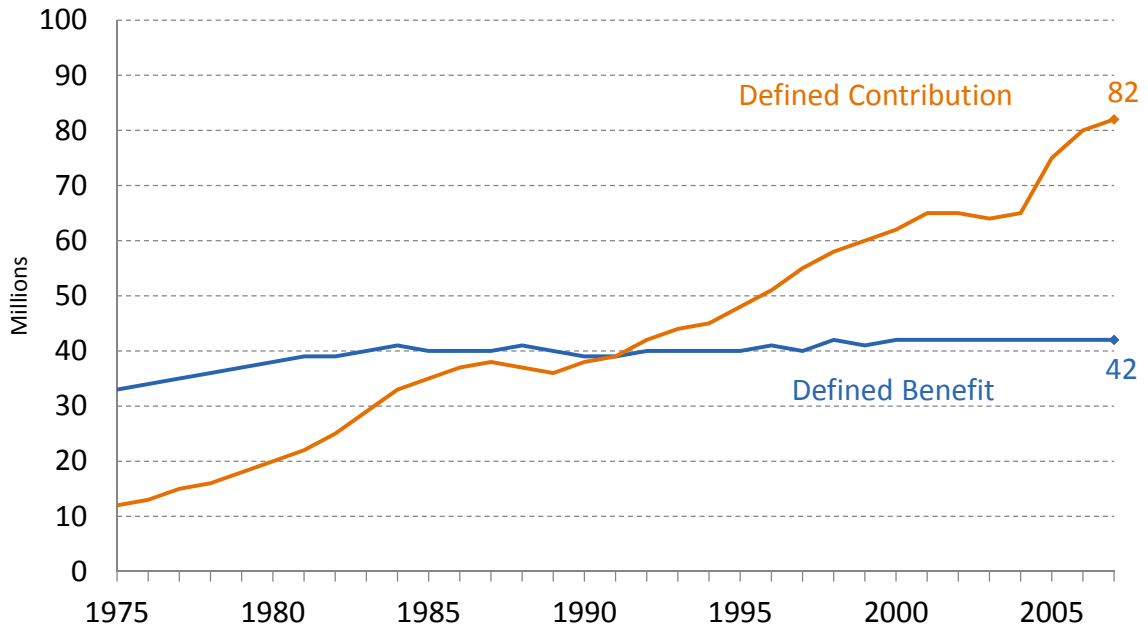



Note: Employers offering active DB plans could also offer a supplementary DC plan.
Source: TowersWatson.

These challenges are also present when a traditional defined benefit plan offers a lump sum option in its plan. According to a study from the Employee Benefit Research Institute[4] (EBRI), when there are no restrictions on lump sum payments from a final average pension plan, only 44% of participants who terminate employment between ages 50 and 75 elect an annuity; just 22% of such participants in cash balance plans elect an annuity.

According to a study by TowersWatson,[5] about one-third of traditional defined benefit plans offer lump sum options. Most hybrid defined benefit plans offer a lump sum payment.

**Figure 2.2 Number of Retirement Plan Participants (Millions), by Plan Type, 1975-2007[3]**




Note: Data from private-sector qualified defined benefit and defined contribution plans and participants.

Source: Employee Benefit Research Institute.

***Given improvements in life expectancies, the money set aside for retirement may need to last a long time — potentially 20 to 30 years or more. An additional challenge is that individuals don't know how long their money needs to last, given the unpredictable nature of individual lifespans.***

Figure 2.3 shows that for a 65-year-old man, there's a:

- 50% chance he'll live to age 85,
- 30% chance he'll live to age 90 (almost one out of three), and
- 12% chance he'll live to age 95 (greater than one out of ten).

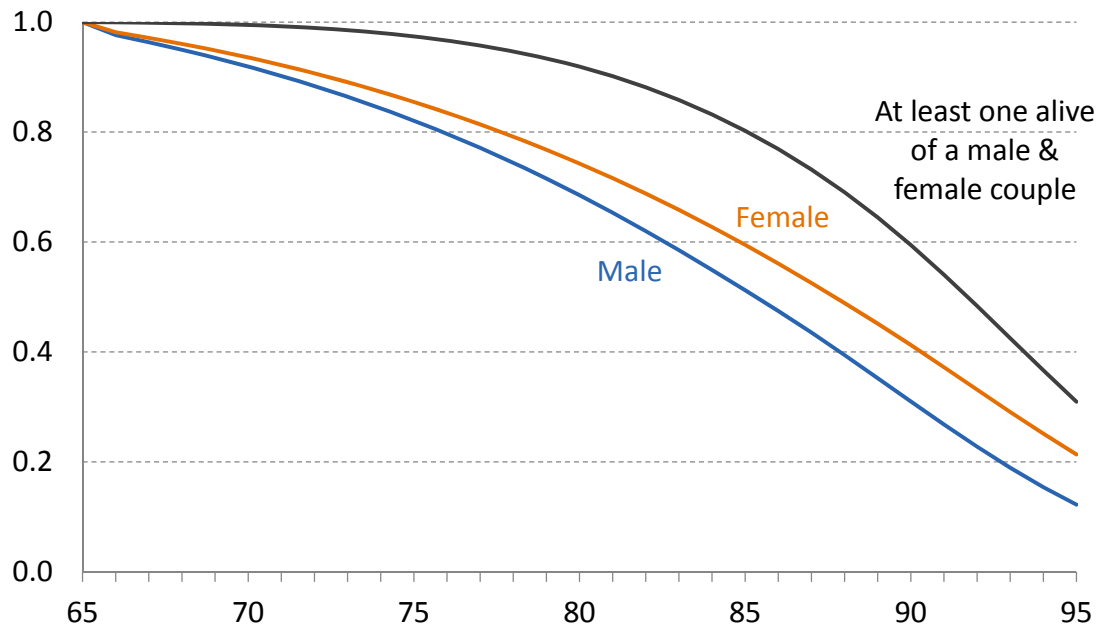
Similarly, for a 65-year-old woman, there's a:

- 50% chance she'll live to age 87,
- 41% chance she'll live to age 90 (greater than one out of three), and
- 21% chance she'll live to age 95 (greater than one out of five).

For a male and female couple, both age 65, there's a:

- 50% chance at least one will live until age 91, and
- 31% chance at least one will live to age 95 (almost one out of three).

**Figure 2.3 Probability of Surviving from Age 65 to 95, Separately for Male, Female, Married Couple Both Age 65**



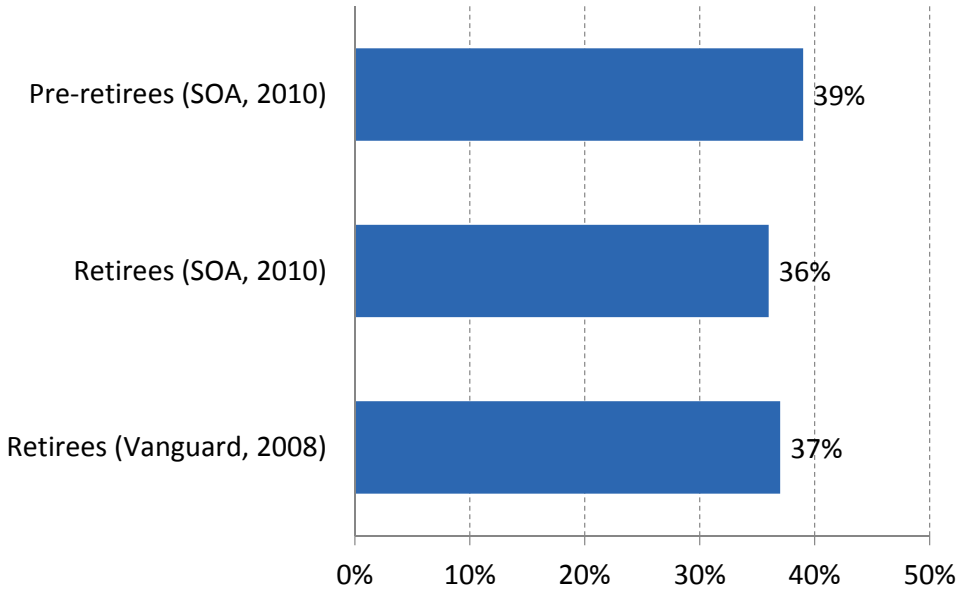

Source: RP-2000 mortality table projected to 2013 with Scale BB.

***Retirees are doing a poor job of managing retirement risks.***

Ideally, a new retiree would develop and adopt a formal strategy that would generate a source of lifetime income from retirement savings. But the most prevalent method of deploying retirement savings is simply to spend the money on current living needs without seriously considering that the money needs to last for life.

In one study of retirees conducted by Vanguard,[6] 21% of respondents reported no formal approach to deploying retirement savings, 10% cited “gut feel,” and less than 10% reported using a formal approach to generating retirement income. The chart below shows results from the Vanguard study and another study conducted by the Society of Actuaries,[7] identifying the most common method of drawing down retirement savings as "to meet current living expenses."

**Figure 2.4 Percentage of Retirees and Pre-retirees Who Plan to Withdraw from Savings to Meet Current Living Expenses[6, 7]**




Sources: Society of Actuaries and Vanguard.

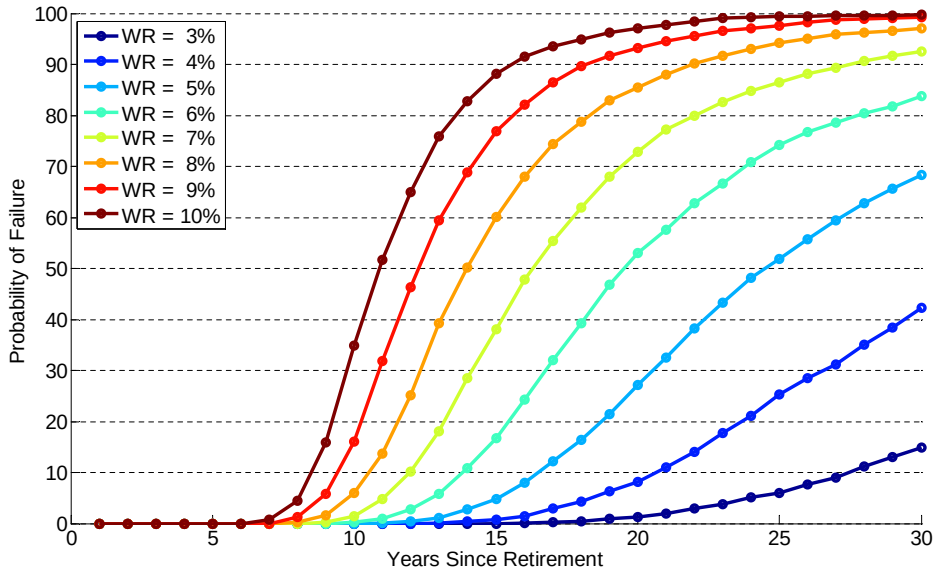
***Retirees are planning to spend assets at an unsustainable rate.***

Many retirees are drawing down or planning to draw down their savings at rates that have a high chance of savings depletion. (In other words, many retirees may outlive their money.) One survey from Wells Fargo[8] shows the median annual rate that retirees plan to withdraw from their invested savings is 10% of assets; at this rate, retirees have a very high chance of outliving their savings, as shown in Figure 2.5.

The sustainable withdrawal rate — one that offers retirees a high probability of making their savings last for life — has been the subject of considerable analysis and debate, but no credible analyst would ever suggest a withdrawal rate as high as 10%.

This is evident in Figure 2.5, which shows the chances of depleting assets over various periods for different withdrawal rates. A 10% withdrawal rate has more than a 90% chance of failure after 15 years of retirement. (The withdrawal amounts shown below are real; the dollar amounts of retirement income are adjusted for inflation during retirement.)

**Figure 2.5 Probability of Savings Depletion for Various Withdrawal Rates**

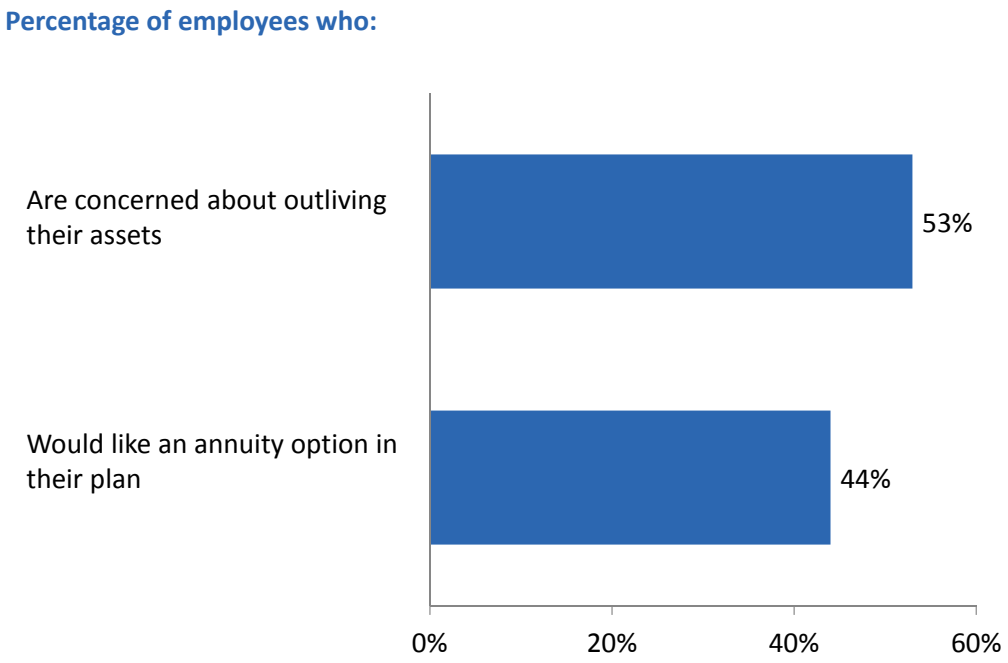



Note: For systematic withdrawals–constant amount (see Appendix B for definition), portfolio invested 60%/40% in stocks/fixed income.

Source: Dr. Wade Pfau.

*Employees and retirees want and need help generating retirement income.*

**Figure 2.6 Employee Preferences and Concerns Regarding Retirement Income[9]**




Source: MetLife.

Although Figure 2.6 shows that 44% of employees would like an annuity option in their retirement plan, according to a recent GAO study,[10] immediate annuity elections at the time of retirement are in fact very low:

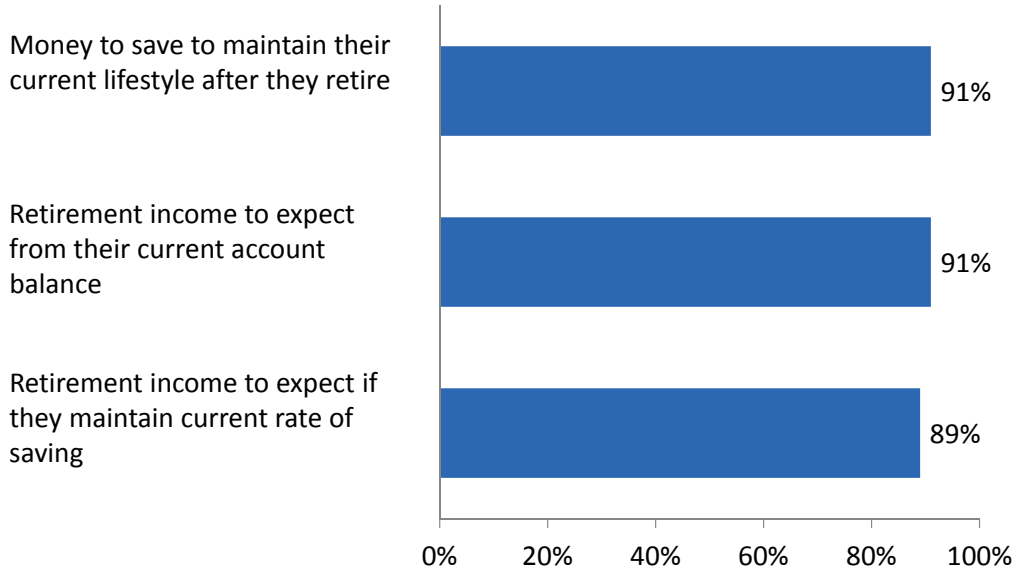
- Just 6.1% of retiring employees elected an annuity as a way to generate retirement income.
- Immediate annuities represent just 3% of the overall annuity market.

These statistics may underestimate the potential usage of annuities, as some retirees may plan to delay the purchase of annuities until after their initial retirement date.

Figure 2.7 provides evidence that many employees would like information that would help them decide how to deploy their retirement savings to generate income.

**Figure 2.7 Employees Want More Information about Generating Retirement Income[11]**

**Percentage of employees who would find "very valuable" or "somewhat valuable" a statement about how much:**

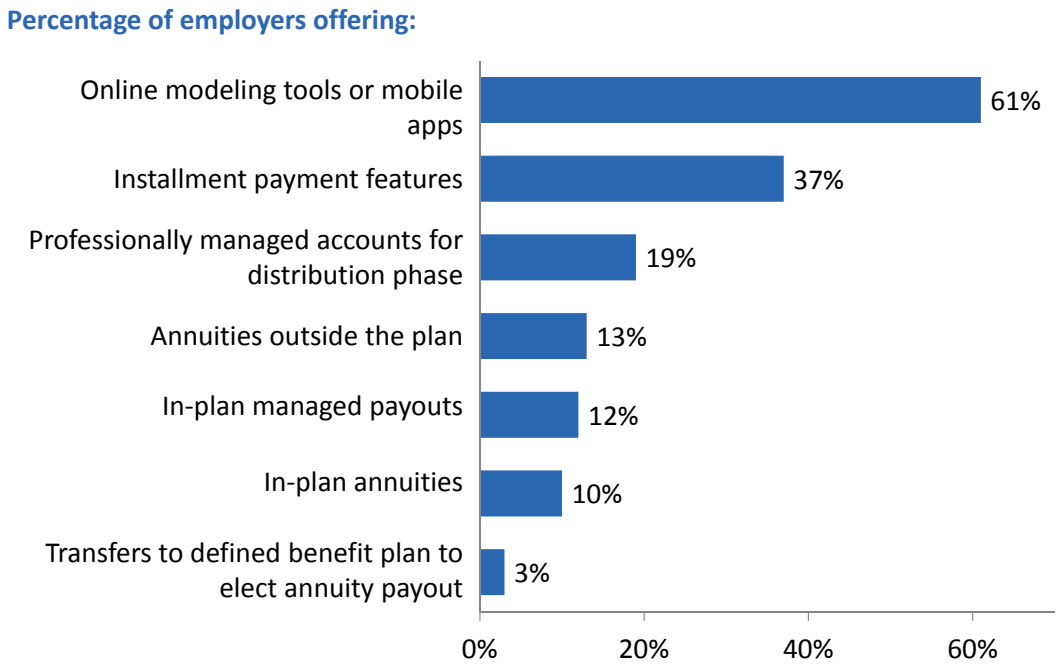



Source: Employee Benefit Research Institute.

***Robust retirement income options are not widespread among defined contribution plans.***

A 2013 survey by AonHewitt[12] of more than 400 employers covering over 11 million employees shows that retirement income options are more the exception than the rule.

**Figure 2.8 Retirement Income Options Provided by Employers[12]**




Source: AonHewitt.

# SECTION THREE: PLAN SPONSOR CHALLENGES AND FIDUCIARY ISSUES

Plan sponsors typically have a number of goals for implementing a retirement income program in their defined contribution retirement plans:

- Make the plan better meet its primary purpose – delivering retirement security.
- Meet participants' needs to generate reliable retirement income.
- Plan for an orderly succession in the workplace so that older workers can retire when they are no longer productive.
- Accommodate a reasonable number of different financial goals that participants might have, thereby improving the security and satisfaction of employees and retirees.
- Minimize exposure to fiduciary liability for selecting and monitoring retirement income options. See Callout Box 3.1 for a summary of the issues and potential actions to address this concern.
- Help employees maximize the retirement income they can generate from their savings.
- Help participants understand their options and make effective decisions, and then assist with implementing those decisions.
- Overcome participant inertia regarding retirement planning and encourage utilization of the retirement income solutions offered by the plan.
- Minimize administrative complexity, including managing the number of retirement income providers and coordinating between these providers and the plan sponsor and plan administrator.
- Provide flexibility to replace plan administrators and retirement income providers.

To meet these goals, plan sponsors must define a strategy that considers the following:

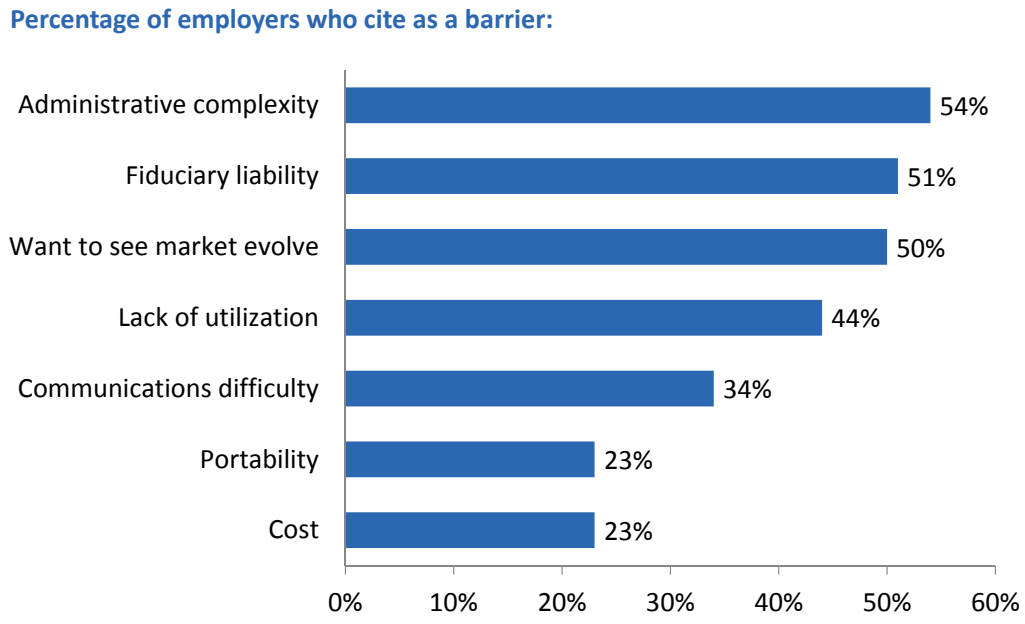
- The number and type of retirement income solutions to offer
- The number and type of providers to select
- The default retirement income solution and who it applies to
- How to mitigate fiduciary liability
- How plan sponsors will make decisions regarding the retirement income options they offer to participants and how to monitor them on an ongoing basis

To implement such a strategy, plan sponsors should take the following steps:

- Set up a rigorous and documented process for designing a retirement income program, evaluating retirement income offerings, assessing the financial stability of retirement income providers, and then monitoring solutions and providers on an ongoing basis.
- Implement a default retirement income generating option that would become effective when a retiree fails to make an election and minimizes plan sponsor fiduciary liability. See Callout Box 3.2 for a discussion of the issues surrounding default RIG solutions.
- Select the retirement income strategies to offer plan participants. Possibilities include financial products such as annuities or managed payout funds, professionally managed accounts, installment payment features in the plan, and combinations of these strategies.
- Decide if the plan should offer retirement income options in the plan, outside the plan (on the way out of the plan), or both.

When plan sponsors perceive an inability to meet these goals or some difficulty involved with making these decisions, this can create a barrier to implementing a retirement income program. For example, Figure 3.1 summarizes data from a recent study by AonHewitt[12] that cites various barriers to implementing retirement income options.

**Figure 3.1 Barriers to Adding Retirement Income Solutions[12]**




Source: AonHewitt.

On an optimistic note, the percentage of employers showing no interest in implementing retirement income options for their employees dropped from 57% to 27% between 2012 and 2013.

**Callout Box 3.1: Selecting Lifetime Income Solutions: Practical Fiduciary Considerations**

By Fred Reish, Bruce Ashton, and Joshua Waldbeser
Drinker Biddle & Reath LLP

Selecting a lifetime income solution for defined contribution plan participants is a fiduciary act, one that requires that plan fiduciaries — typically, the employer or a plan committee — engage in a prudent process. By "lifetime income solution," we mean a product or service such as an annuity, guaranteed minimum withdrawal benefit feature, managed payout mutual fund, or managed account service designed to provide a stream of income for the life of a participant in retirement. That period could be as much as 30 years or longer.

Presumably because of the long-term nature of the payout, the selection may seem more daunting than other fiduciary decisions. In reality, it is not. The process is the same as with any other fiduciary decision: The committee must gather and analyze information and make an informed and reasoned decision. The only difference is in the type of information that must be reviewed.

In this section, we first summarize the fiduciary requirements under the Employee Retirement Income Security Act (ERISA) of 1974, describe "safe harbor" rules that may apply to the selection of a lifetime income solution, and then discuss the information that would be appropriate to obtain. Keep in mind that plans are not currently required to offer a lifetime income solution, so the issues discussed here arise only if it does.

**Fiduciary process fundamentals**

ERISA, as amended, requires fiduciaries to act in the best interest of the participants and for the exclusive purpose of providing them with benefits. In so doing, fiduciaries must act prudently, which the courts have characterized as requiring fiduciaries to engage in a prudent decision-making process. (Note that plans sponsored by state and local governments and certain tax-exempt entities are exempt from the requirements of ERISA, though they are generally subject to similar fiduciary principles under state law. Since the state law rules are less well-developed, this discussion focuses on the requirements of ERISA.)

ERISA's prudent process requires a committee to act on the basis of the "circumstances then prevailing." In other words, the committee is required to assess facts available to it today in making a decision; it is not expected to know or be able to predict the future. The committee is judged more by the steps it takes in making a decision and less by the ultimate outcome of its decision. That said, as circumstances change, the committee is expected to revisit its decisions, an act referred to as the "duty to monitor."

What are the steps in the prudent process? First, there is the duty to investigate and evaluate, and to engage in a thorough and objective assessment of relevant information. Second, there is an obligation to make a reasoned decision based on that assessment. This is sometimes referred to as "the requirement to make an informed and reasoned decision." If committees follow this process diligently, they have fulfilled the "prudent man" requirement of ERISA.

**Selecting lifetime income solutions**

A lifetime income solution is intended to provide a stream of income that lasts for the remainder of a retiree's life. While there are a variety of products or services that are designed to achieve this objective, only those offered by insurance companies can guarantee this result. But the guarantee is only as good as the financial soundness of the insurance company. So how does a committee select a provider that they can be sure will be around in 30, 40, or even more years?

The short answer is that they cannot do so with absolute certainty, but under ERISA, they do not have to. Rather, a committee is required to assess information available to it today to reach an informed conclusion that, based on the information available, the provider appears to be financially able to meet its future commitments.

This process has been described by the Department of Labor (DOL), which interprets and enforces ERISA in a regulatory "safe harbor" related to the selection of annuity providers for defined contribution plans. (When a committee follows the requirements of a "safe harbor," it is deemed to have properly fulfilled its obligations under ERISA. As such, it establishes a process that is above and beyond the basic obligations that ERISA may require.) While the regulation addresses only the selection of annuity providers, it is also instructive in considering the steps for selecting other insured lifetime income solutions.

The regulation describes the five steps a committee must follow to obtain safe harbor fiduciary protection:

1. It must engage in an objective, thorough, and analytical search for the purpose of identifying and selecting providers.
2. It must appropriately consider information sufficient to assess the ability of the provider to make all future payments under the contract or arrangement.
3. It must appropriately consider the cost (including fees and commissions) of the contract in relation to the benefits and administrative services to be provided under the contract.
4. It must appropriately conclude, at the time of the selection, that the provider is financially able to make all future payments and the cost of the contract is reasonable in relation to the benefits and services to be provided.
5. If necessary, it must consult with an appropriate expert or experts for the purposes of compliance with the safe harbor regulation.

Unfortunately, the regulation does not describe the specific information a committee should consider, but the key factors would include:

- the provider's experience and expertise with like products,
- the provider's level of capital, surplus, and reserves,
- the provider's ratings (by insurance rating services) across the various rating services and for a period of years covering several economic cycles,
- the terms of the product,
- the costs associated with the product, and
- additional protections offered through state insurance guaranty associations.

There is no regulatory safe harbor for evaluating and selecting mutual funds, investment accounts with managed payout features, or other lifetime income solutions. However, industry standards for uninsured investment products are well-established and can be extrapolated to those with special retirement income features. Generally, the key factors to be taken into account in evaluating any investment product or service include:

- The quality and stability of the organization and its management team,
- The investment manager's experience and expertise with similar products and/or services,
- The fees and expenses attendant to the vehicle, as compared to similar vehicles in the marketplace (e.g., the expense ratio of a mutual fund or management fees of an account),
- The historical investment performance of the vehicle against its relevant benchmark,
- The general appropriateness of the product or service for the plan and its participants, and
- The type, quantity, and quality of services provided, including participant communications and education.

**Conclusion**

Selecting lifetime income solutions is a responsibility to be undertaken with the same level of diligence observed when evaluating any investment or service provider. Plan sponsors and committees are not guarantors of lifetime income, just as they are not required to guarantee future investment results for other types of investments. The key is to follow the steps necessary to make an informed and reasoned decision.

**Callout Box 3.2: Issues Regarding Default Retirement Income Solutions**

Default solutions in qualified defined contribution (DC) plans have enjoyed considerable success for the period in which plan participants are accumulating savings for retirement. Auto-enrollment and auto-escalation features have helped increase the amounts that participants are saving. Qualified default investment alternatives (QDIAs), such as target date funds, have helped participants avoid the worst mistakes during periods of market volatility, namely panicking and selling equity investments at market downturns just before the stock market recaptures its losses. Auto-enrollment and auto-escalation features and QDIAs have all been supported by regulations promulgated by the Department of Labor.

Considerable research in behavioral finance supports the notion of utilizing default solutions for complex financial decisions. Because of this research and the success of defaults in the accumulation phase, it's natural that plan sponsors and their advisors would hope to reap the advantages of defaults when designing a program of retirement income for their DC plan.

At the time of this paper's publication, little guidance exists that provides regulatory guidelines for designing a specific default retirement income solution for a qualified retirement plan. As a result, plan sponsors are concerned about their fiduciary exposure should they automatically default retiring employees into a retirement income option that is specified by the plan sponsor. In addition, it may be difficult to design a default retirement income solution that is reasonable in light of the diversity of plan participants' financial and lifestyle circumstances.

In effect, however, a default retirement income solution exists for qualified DC plans: the Required Minimum Distribution (RMD), which specifies minimum amounts that must be withdrawn beginning at age 70-1/2. The RMD, together with the plan's QDIA, might provide a default retirement income solution that can offer the plan sponsor protection against fiduciary exposure, given the lack of regulatory guidance on default income solutions. The RMD has a few positive features:

- It's flexible. At any time, any remaining funds can be deployed by a positive election from a retired participant.
- The RMD may force participants to pay attention to the issue of income generation and make a positive election, because it delays the start of payment until age 70-1/2.
- Funds are intended to last for life.
- It delays taxation to the individual as long as possible.
- The Internal Revenue Code and related regulations provide specific descriptions on how the RMD is to be applied and calculated.

The author notes that the RMD is a legal requirement for tax-qualified plans and has not been sanctioned by regulatory agencies as a safe harbor default retirement income solution. The RMD may not best suit the needs of a particular plan sponsor's participants, but it might serve as a de facto default until regulatory guidance on defaults is provided. Plan sponsors and their advisors will want to track any developments regarding regulatory guidance on default retirement income solutions.

# SECTION FOUR: RISKS FACING RETIRING PARTICIPANTS

When designing a retirement income program, plan sponsors should consider the risks that employees approaching retirement face when deciding how to deploy retirement savings. Some risks are quantifiable with analysis, while other risks are behavioral.

Quantifiable risks

- Potential for outliving savings (longevity risk)
- Market declines early in retirement that are too severe to recover from, often referred to as “sequence of returns” risk
- Too-high withdrawal rates that come with a significant likelihood of outliving savings
- Loss of purchasing power or "inflation risk"
- High fees due to expenses, commissions, and transaction costs
- Losses due to provider insolvency
- Liquidity risk — not having access to savings in the event of an emergency
- Inadequate income for surviving spouse or partner due to any of the quantifiable or behavioral risks mentioned herein

Behavioral risks

- Inadequate understanding of the need for a systematic method to generate lifetime retirement income
- Temptation to spend savings today or "behavioral finance risks"
- Risk of savings loss due to mistakes, fraud, or cognitive decline in later years
- Financial losses due to poor or biased financial advice
- Spending on health or long-term care that can exhaust savings
- Inability of the participant to assess and self-execute decisions to address the above risks — the risk of doing it by oneself without guidance or advice

This paper discusses how plan sponsors can help their retiring employees address these risks with a robust retirement income program.

# SECTION FIVE: CONTEXT OF RETIREMENT PLANNING DECISIONS

Retirees should make their retirement planning decisions, including how to generate income from savings, by considering the context of their overall financial and lifestyle circumstances. When designing a retirement income program, plan sponsors should also consider these factors as they apply to their plan participants. These factors will have a significant influence on employees' retirement decisions and can be grouped into factors related to retirement income and factors related to living expenses in retirement.

Factors related to retirement income:

- The amount of expected lifetime income from Social Security. Many analysts advocate that the primary wage earner delay their Social Security retirement income as long as possible (but no later than age 70) to increase the expected lifetime payouts. In fact, delaying Social Security may be a cost-effective way to "buy" additional inflation-adjusted guaranteed annuity income (see Callout Box 5.1). In addition, sophisticated strategies exist to maximize the expected lifetime payout for married couples. Currently about half of all Americans claim Social Security at age 62, the earliest possible age with the lowest amount of retirement income; many analysts believe this provides a sub-optimal result.

- The existence of other sources of guaranteed lifetime income, such as a defined benefit plan. If the defined benefit plan offers a lump sum option, then retirees who elect this option face all the issues regarding generating retirement income from savings that are described in this paper.

- The total amount of retirement savings available to generate income. Retirees with substantial savings have more options for generating income and leaving a legacy and also more room for making mistakes than retirees with modest savings, who may need to focus on squeezing the most reliable income they possibly can from their savings.

- Savings and resources from multiple employers. Retirees may wish to consolidate this money in order to more carefully manage their retirement income.

- Required minimum withdrawals (RMD) from employer-sponsored tax-qualified retirement plans and deductible IRAs at age 70-1/2 (described in Callout Box 3.2). Although IRS rules generally require that minimum withdrawals be made starting at this age, this money need not be spent; it just must be withdrawn so it is then subject to taxation.

- The existence of other financial resources that can provide income, such as home equity.

- The potential to work during retirement to supplement retirement resources. Some retirees may choose to work during retirement, although they eventually may not be able to find work, or health issues may drive them out of the workplace.

- Desired goals for leaving a legacy. Money set aside for an inheritance or legacy will typically reduce the amount of income available during retirement.

Factors related to living expenses in retirement:

- The expected pattern of living expenses. There is evidence that people spend less money as they age, although it's not been demonstrated conclusively whether this decline is voluntary or forced due to diminishing financial resources. On the other hand, medical costs often increase with age.

- The overall level of living expenses, including debt. Retirees who have paid off their home mortgage and have no debt have significantly lower living expenses than retirees with substantial debt.

- The amount of money that is desirable to set aside for unforeseen expenses and emergencies.

- The threat of potentially ruinous expenses for medical and long-term care, and options for meeting those expenses. Retirees may wish to integrate their strategies for generating retirement income and protecting against this threat.

- The level of income taxes. For many low- and middle-income retirees, income taxes are low in retirement and need not be a primary factor when determining retirement income strategies. For this reason, this paper will not address tax issues.

When developing a retirement income program, plan sponsors should take into account the possibility for diverse circumstances among their retirees with respect to the above factors. Plan sponsors should also consider the above factors when designing tools and communications programs to help retiring employees make educated decisions about retirement income solutions.

**Callout Box 5.1: Optimizing the Combination of Social Security Benefits and Income from DC Retirement Plans**

Social Security benefits provide a significant proportion of retirement income for the majority of Americans. To illustrate: Data from the Social Security Administration[13] shows that Social Security provides 50% or more of all retirement income for 65% of retirees, and 90% or more of all retirement income for 36% of retirees. As a result, low- and middle-income workers who optimize their Social Security benefits can significantly improve their financial security in retirement.

Yet roughly half of all Americans start Social Security benefits at age 62, the earliest possible age with the lowest amount of retirement income. Many analysts have demonstrated that this claiming behavior is suboptimal for people in average or above-average health, and that retirement security can be enhanced substantially by delaying the start of Social Security income. For instance, delaying the start of benefits from age 62 to age 66 can increase annual Social Security income by 33%, while delaying to age 70 can increase annual Social Security income by 76%.

Dr. John B. Shoven, director of the Stanford Institute for Economic Policy Research, together with Sita N. Slavov, has written a series of papers and pamphlets[14] that explain how Americans can effectively delay the start of Social Security benefits. Most Americans use retirement savings to supplement Social Security income and start withdrawing from savings upon retirement, a method Dr. Shoven calls a "parallel" strategy." Dr. Shoven advocates instead using a "series" strategy, in which retirees draw down retirement savings first and delay the start of Social Security benefits until age 70. In effect, retirement savings are used to "buy" a higher annuity from Social Security.

This effective "annuity purchase rate" is a much more favorable rate than the cost of annuities purchased from private insurance companies in today's market. The reason is that Social Security's delayed retirement credits were developed when interest rates were much higher and life expectancies were lower compared to today, and before Social Security benefits were indexed for inflation. As a result, Social Security's delayed retirement credits are more than fair actuarially.

Dr. Shoven's papers and pamphlets contain hypothetical examples of single retirees and couples who can increase their retirement incomes by several hundred dollars per month at age 70 if they delay Social Security benefits for the primary wage earner from age 62 to age 70. The increase in retirement income from deploying this strategy translates to $1,000 to $1,400 per month by age 90. In one example, the gain in the expected present value of retirement income was $200,000.

For many retirees, these increases represent the difference between poverty and comfort. Since the delayed retirement credit is reflected in survivors' benefits, delaying commencement of Social Security income also significantly improves the financial security of widows and widowers.

Employers and plan sponsors could facilitate the implementation of the strategy advocated by Dr. Shoven, either by offering employees the ability to work part time and/or by offering retirees the ability to withdraw fixed amounts from their account balances for specified periods to cover living expenses while Social Security benefits are being delayed. The period for these payouts could be as long as eight years, enabling a participant to delay Social Security from age 62 to age 70, the longest possible period to delay commencement of Social Security benefits. Employers can also help by providing guidance on and evaluation tools for Social Security claiming strategies.

# SECTION SIX: SUMMARY OF POTENTIAL RETIREMENT INCOME GENERATORS

***Three methods for generating retirement income***

There are three basic methods for generating retirement income from any type of savings, whether in an employer-sponsored retirement plan or from individual savings:

1. *Investment earnings*: Invest the assets, leave the principal intact, and spend just the interest and dividends. Realized capital gains are typically reinvested but are available to be spent.
2. *Systematic withdrawals*: Invest the assets and draw down the principal and investment earnings with a formal method intended — though not guaranteed — to make the money last for life.
3. *Annuity purchase*: Transfer savings to an insurance company that guarantees a lifetime retirement income. Survivor benefits may be available through a joint and survivor annuity, period certain annuity, or cash refund feature.

Each method can be implemented using a variety of financial instruments and/or approaches:

- *Investment earnings*: mutual funds and exchange-traded funds of stocks, bonds, and/or cash investments; bank deposits; direct investment in individual stocks and bonds; real estate income property; or real estate investment trusts (REITs).
- *Systematic withdrawals*: self-managed, professionally managed, or managed payout fund. Common strategies include constant dollar amount (with or without adjustment for inflation), endowment method (constant percentage of assets), and life expectancy method (withdrawals spread over remaining life expectancy).
- *Annuity purchase*: immediate fixed income annuity, immediate variable income annuity, immediate inflation-adjusted income annuity, deferred fixed income annuity, deferred variable income annuity, longevity insurance, and guaranteed minimum withdrawal benefit (GMWB).

Appendix A contains a summary of various retirement income products, and Appendix B contains a glossary of terms used to describe retirement income products and solutions.

There can be advantages to using a combination of strategies to allocate portions of retirement savings to different strategies. In addition, a retiree may want to change retirement income generators (RIGs) during retirement to meet evolving needs.

This paper focuses on systematic withdrawals and annuities, since these solutions are more complex than using investment income and produce higher amounts of retirement income.

***Three characteristics of retirement income generators***

The following characteristics aren't mutually exclusive, meaning that RIGs with different features may coexist in a plan.

Characteristic #1: In-plan vs. out-of-plan

- **In-plan:** Assets remain in the qualified plan trust, either as invested assets or group annuity contracts held by the plan. Retirement income is paid from plan assets to retirees, and the underlying assets are included for the purpose of government reporting. One common example: Many defined contribution plans offer a fixed installment payout feature (typically on a monthly or quarterly basis) that could be used to implement a systematic withdrawal strategy, together with the investment funds offered by the plan.

- **Out-of-plan (or "on-the-way-out-of-plan"):** The plan sponsor facilitates the transfer of participant assets to a selected financial institution or institutions, typically an insurance company, mutual fund company, or brokerage firm, that generates retirement income for the retiree. The plan sponsor is involved with identifying these institutions, publicizing them to plan participants, and facilitating the transfer of assets out of the plan upon retirement. Once assets have been transferred, the plan sponsor has no relationship with the retiree and assets aren't included in government reporting. This is not to be confused with a garden-variety IRA rollover, where the plan administrator transfers assets to any financial institution identified by the retiree; such transactions have not been analyzed or facilitated by the plan sponsor.

  *Note on sex-neutral vs. sex-distinct pricing for annuities*: If an annuity product is offered within a tax-qualified employer-sponsored retirement plan, it must be priced on a sex-neutral basis, meaning that men and women of the same age will pay the same amount for a given amount of retirement income. In a qualified defined contribution plan, this advantages women and disadvantages men, because although women are expected to outlive men, they would be allowed to pay the same amount to produce a given amount of retirement income. In a qualified defined benefit plan that offers lump sums, this disadvantages women relative to men, for the same reasons.

  If an annuity is offered outside a tax-qualified plan, such as through an IRA rollover or out-of-plan option, the insurance company is allowed to offer annuities using sex-distinct pricing, charging more for annuities for women based on the assumption that women live longer than men on average. Compared to sex-neutral pricing, sex-distinct pricing advantages men and disadvantages women. It is possible, however, that a man could still receive more retirement income from sex-neutral pricing in a tax-qualified plan compared to sex-distinct pricing in a retail environment, since in-plan annuities may realize institutional group pricing compared to individual pricing in a retail environment.

Characteristic #2: Products vs. advice vs. guidance

- **Products:** A financial institution invests the assets and delivers the income to the retiree. Examples include any type of annuity and a managed payout fund. Some financial institutions offer products that combine managed payout funds and annuities. Appendix A contains a summary of various retirement income products offered by financial institutions.

- **Advice:** A professional advisor recommends the specific asset allocation among the funds in the plan during both the accumulation and payout phases, as well as the periodic withdrawal amount in the payout phase, reflecting the employee's goals and circumstances. In some instances, the advisor will also implement and monitor the decisions. These advisors typically work with systematic withdrawal methods, although some may provide advice on annuities. It is important for the plan sponsor to determine whether the advisor is working with a broad range of products and helping employees understand options, or if they are working with a single option only. In the latter case, it is vital for employees to understand the risks embedded in the single option.

- **Guidance:** The plan sponsor can offer retirees an installment payment feature coupled with appropriate target date funds, and provide information, strategies, and/or online modeling to help retirees decide how much retirement income can be generated from their savings.

Characteristic #3: At retirement vs. leading-up-to-retirement

- **At retirement:** Assets remain invested up to retirement, and the RIG is implemented at the time of retirement. Investment volatility and interest rate changes immediately before retirement are risks borne by the retiree. In many instances, funds may be left invested in the plan upon retirement, to be deployed in a RIG at some point after retirement.

- **Leading-up-to-retirement:** Some solutions attempt to protect against investment volatility or changes in interest rates in the years leading up to retirement. Deferred fixed annuities and GMWB annuities are examples of such insured products, while target date funds or professionally managed accounts may reduce the exposure to equities in the years leading up to retirement.

Solutions that are practical today

The following RIGS are practical in today's environment and encompass the three basic methods of generating retirement income and the three characteristics, as discussed above:

In-plan:

- Installment payments coupled with target date funds
- Professionally managed accounts
- Deferred or immediate group annuity contracts
- Annuity bidding services
- Guaranteed Minimum Withdrawal Benefit (GMWB) annuity contracts
- Solutions that combine systematic withdrawals and annuities

Out-of-plan:

- Managed payout funds
- Annuity bidding services
- Immediate annuities
- Longevity insurance

While it's expected that new retirement income products and services will be introduced in the near future, a number of viable solutions are currently available to plan sponsors. See Callout Box 6.1 for a partial list that provides evidence for this statement.

**Callout Box 6.1: A Partial List of Currently Available Retirement Income Products and Services**

Many viable retirement income solutions have been introduced recently by insurance companies, mutual fund companies, and advisory firms. Shown below is a partial list as of July 2013. Inclusion on this list does not imply any endorsement of these institutions or their solutions; the list's sole purpose is to demonstrate that there are viable solutions offered by credible financial institutions at the current time.

<u>In-plan</u>

- Systematic withdrawals through professionally managed accounts: Financial Engines, Guided Choice
- Immediate annuity bidding service: Income Solutions
- Guaranteed minimum withdrawal benefits (GMWB): Great-West SecureFoundation, Prudential IncomeFlex, Transamerica SecurePath for Life
- GMWB bidding service: AllianceBernstein
- Systematic withdrawals for fixed period combined with deferred annuity: UBS Lifetime Income
- Group immediate or deferred fixed income annuity contracts: available from many insurance companies

<u>Out-of-plan</u>

- Immediate annuity bidding service: Income Solutions, Fidelity Investments, Schwab, Vanguard
- Managed payout funds: Fidelity Investments, Schwab, Vanguard

Some of the above products and services are also available on the platforms of plan administrators such as AonHewitt, Fidelity Investments, J.P. Morgan, Mercer, T. Rowe Price, Vanguard, Wells Fargo, and Xerox.

# SECTION SEVEN: RETIREMENT INCOME GENERATORS — SPECIFIC FEATURES AND EVALUATION CRITERIA

There are a number of specific features that retirees should consider when selecting a RIG. Plan sponsors should consider these same features when evaluating RIGs to offer in their plan:

- Amount of initial income provided. How does this amount compare to what the retiree might get with other RIGs?
- Lifetime guarantee. Is this income guaranteed for life no matter how long the retiree lives?
- Pre-retirement protection. Can the amount of retirement income be influenced by investment volatility or changes in interest rates before retirement?
- Post-retirement increase potential. After retirement, is there a potential for the retirement income to increase in order to address inflation risk?
- Post-retirement decreases. After retirement, is the retirement income protected from decreases due to asset declines?
- Access to savings. Can savings be accessed after retirement income has started?
- Inheritance potential. Are remaining assets at death available for a legacy?
- Investment control. Who controls the investment of retirement savings?
- Withdrawal control. Who controls the amount of withdrawal from savings for retirement income?

It's important to realize that most RIGs do not meet all of the above features; if a RIG tries to meet most or all of these features, there's usually a price to pay, either with reduced retirement income or higher fees. This is one important reason why a combination of RIGs may best meet an employee's specific circumstances.

The above list illustrates the features of specific RIGs. In addition to these features, here are more considerations for selecting a specific retirement income provider:

- Level of fees and whether these fees can increase in the future
- Support provided to participants before, at, and during retirement
- Financial stability of the provider
- Flexibility in timing of making choice (before, at, or during retirement)
- Option to invest only a portion of retirement savings
- Option to implement a solution in stages throughout retirement, such as through the phased purchase of annuities
- Access to competitive purchasing
- Ability to make changes in retirement income solutions, providers, and/or plan administrators.

With respect to the last item, the ability to make changes in solutions, providers, and/or plan administrators, here are a few observations:

- With out-of-plan solutions, it is usually possible to make changes prospectively for future retirees, but retroactive changes for existing retirees are not possible.
- It is usually possible to make prospective changes with remaining assets under in-plan systematic withdrawal methods and managed payout funds.
- It is not usually possible to make changes for an existing retiree once an immediate fixed, inflation-adjusted, or variable annuity is purchased. However, it is possible to change insurance companies for future retirees.
- GMWB contracts must be examined on a case-by-case basis for making plan-wide changes. Individual retirees can generally withdraw assets after retirement, subject to the loss of guarantees and other terms and conditions of the GMWB contract.

# SECTION EIGHT: COMPARISON AND DISCUSSION OF HOW VARIOUS RIGs MEET EVALUATION CRITERIA FROM RETIREES' PERSPECTIVES

As discussed in Section 7, most RIGs do not meet all the possible evaluation criteria. People approaching retirement will need to make calculated tradeoffs among the pros and cons of various RIGs when selecting the one or ones that work best for them, depending on their goals and circumstances.

Table 8.1 below summarizes how various RIGs meet the evaluation criteria discussed in Section 7 from the perspective of the retiree, except for the initial amount of retirement income. See Section 7 for definitions of the criteria shown in the first column.

"Yes" answers generally indicate favorable responses and "no" answers indicate unfavorable answers (although it could be debatable if investment and withdrawal control is desirable). Section 10 shows projections of retirement income amounts for six different RIGs.

**Table 8.1 How Different RIGs Meet Various Criteria from Retiree Perspective**

| Criteria | Systematic withdrawals (any self-managed method) | Systematic withdrawals (advisory service or managed payout fund) | Deferred fixed income annuity | Immediate fixed income annuity | Immediate variable income annuity | Immediate inflation-adjusted income annuity | GMWB annuity |
|---|---|---|---|---|---|---|---|
| Lifetime guarantee | No | No | Yes | Yes | Yes | Yes | Yes |
| Pre-retirement protection | No | No | Yes | No | No | No | Yes |
| Post-retirement increase potential | Yes[1] | Yes[1] | No | No | Yes[1] | Yes[3] | Yes[2] |
| Post-retirement protection | No[1] | No[1] | Yes | Yes | No[1] | Yes | Yes |
| Access to savings | Yes | Yes | No | No | No | No | Yes[4] |
| Inheritance potential | Yes | Yes | No | No | No | No | Yes[4] |
| Investment control | Yes | No[5] | No | No | Yes[6] | No | Yes[6] |
| Withdrawal control | Yes | No[5] | No | No | No | No | Yes[7] |

[1]Depends on investment performance

[2]Depends on investment performance and contract rules

[3]Depends on measure of inflation used in annuity contract

[4]Subject to contract rules, subject to fees and adjustments in account value

[5]No control while participant transfers control to advisory service; participant can withdraw funds from service at any time

[6]Depends on contract provisions; for GMWB annuities, limits may exist for allocation to stocks

[7]Amounts in excess of guaranteed amount may be withdrawn, but adjustments and penalties may apply

Below is a discussion of the tradeoffs from the retiree's perspective. Note that the pros and cons of annuities compared to systematic withdrawals often complement each other.

Annuity products

- Pros:
  - Lifetime guarantee (single or joint). Assures the annuitant that he or she will not exhaust savings.
  - Protection against investment volatility after retirement (except for variable income annuities)
  - Protection against making mistakes or losing funds due to cognitive decline and the risk of fraud
  - Protection provided by state guaranty funds in the event of insurer bankruptcy

- Cons:
  - No ability to access savings or provide an inheritance with unused funds (except for GMWB annuities, although the guaranteed income on these annuities will generally be lower compared to other annuities)
  - No potential to increase retirement income if investment experience is favorable (except for variable and GMWB annuities)
  - Subject to investment risk or interest rate changes in period leading up to retirement (except for deferred fixed income annuities and GMWB annuities)
  - Subject to solvency of insurance company (to the extent not covered by state guaranty funds)

Systematic withdrawals

- Pros:
  - Investment returns more favorable than expected can increase amount of retirement income and/or remaining wealth.
  - Ability to access remaining savings at any time
  - Remaining funds at death available for a legacy
  - Retiree can control investments and withdrawal amounts.

- Cons:
  - Retirement savings can be exhausted before death if the retiree experiences poor investment returns, significantly outlives life expectancy, and/or withdraws at a rate too high to be sustained.
  - Retirees may make unscheduled withdrawals higher than planned.
  - Retirees are subject to the risk of making mistakes or losing funds due to cognitive decline, as well as the risk of fraud, incompetent advisors, and/or excessive fees.

In summary, here are common goals and circumstances that various RIGs may meet:

- Systematic withdrawals are typically preferred if the most important goals are flexibility, access to savings, possibility for a legacy with unused funds, and the potential for increase in retirement income if investment performance is favorable. The risk is that savings can be depleted if the retiree experiences poor investment performance, makes mistakes due to cognitive risk, is a victim of fraud or mismanagement, and/or lives well beyond life expectancy.

- Advisory services or managed payout funds are typically used if the retiree desires the advantages of systematic withdrawals but is not comfortable making decisions regarding investments or withdrawal amounts, and is willing to pay for these services through fees assessed against savings.

- Annuities are typically preferred if the most important goals are the guarantee of lifetime retirement income and protection from investment losses. The risk is that with most income annuities, the retiree does not have access to savings, there is no potential for a legacy with unused funds, and retirement income isn't increased by favorable investment performance. Fixed income annuities are also subject to the risk of inflation.

- One concern with many annuities is the loss of funds in the event of death early in retirement. This concern can be addressed by buying annuities with joint and survivor, period certain, and/or cash refund features. Another solution is to diversify the retirement income portfolio by devoting just a portion of retirement savings to annuities, and investing the remainder of savings using systematic withdrawals to generate retirement income.

- Another concern with many annuities is that changes in interest rates in the period leading up to retirement can cause volatility in the amount of retirement income; this concern can be addressed with the purchase of deferred fixed income annuities in the period leading up to retirement, by investing a portion of savings in long-term bonds that would appreciate when annuity prices increase due to declining interest rates, and/or phasing the purchase of immediate annuities in steps after retirement.

- The notable exception to the last three points is a Guaranteed Minimum Withdrawal Benefit (GMWB) annuity. This type of annuity combines the advantages of systematic withdrawals with the advantages of annuities, and can be viewed as a pre-packaged combination approach. In the accumulation phase, it offers protection against market declines and interest rate volatility. In the payout phase, it offers a lifetime guarantee of retirement income and protection of income against market declines. It also offers access to savings, the possibility of a legacy with unused funds, and the potential for increased retirement income if investment experience is favorable. There's a cost for these favorable features — the insurance guarantee fee that's assessed each year on savings.

Because the pros and cons of systematic withdrawals and annuities can complement each other, some retirees may decide that a combination of RIGs may work best for them. Possibilities include:

- Dividing retirement savings among systematic withdrawals and annuities at retirement
- Phased purchase of immediate income annuities. At retirement, a retiree invests most of their retirement savings in a systematic withdrawal method. Then the retiree purchases immediate income annuities with a portion of their remaining retirement savings at certain milestones after retirement. This enables retirees to dollar-cost average their annuity purchases over time and commit more savings to annuities as they age and become less able to manage their savings.
- Systematic withdrawals for the first period of retirement, say 15 to 20 years, combined with longevity insurance to address longevity risk (income annuity starting at an advanced age, say 80 or 85)

In addition to these options, the phased purchase of deferred annuities may also be utilized in the period leading up to retirement to help protect the income from market volatility and interest rate changes just before retirement. This can enable employees to dollar-cost average their annuity purchases leading up to retirement, and it protects against market declines in the years just before retirement.

One study[15] used data from the University of Michigan Health and Retirement Study to show that retirees who have annuitized 30% or more of their retirement savings have greater satisfaction and happiness in retirement. This finding holds true among retirees with various levels of wealth and health. One can speculate that the security of receiving some guaranteed lifetime income is a significant reason for this enhanced satisfaction.

Employers can help participants analyze the combinations discussed above by providing tools and support that review the pros and cons of such an “income portfolio” approach.

# SECTION NINE: DISCUSSION OF TRADEOFFS AMONG VARIOUS RIGs FROM PLAN SPONSOR'S PERSPECTIVE

From the plan sponsor's perspective, the pros and cons discussed previously in Section 8 apply to the extent that plan sponsors want to meet the various needs of their employees. Here are a few additional tradeoffs between annuity products and systematic withdrawals:

Annuity products

- Pros
  - Insurance companies typically handle communications and tax reporting for plan participants.
  - Lifetime guarantees provide assurance that retirees won't outlive their savings.

- Cons
  - In-plan annuity products can be difficult to change prospectively if the annuity product no longer meets the needs of plan participants.
  - Historically, annuities have had low levels of utilization.
  - Annuity products can be challenging to explain to plan participants, who are likely to view the product as an investment rather than an insurance product.
  - The plan sponsor may be exposed to fiduciary liability if the insurance company becomes insolvent. One way to address this risk is to make sure that annuity purchases fall below the limits of state guaranty associations. Another way is to follow the guidelines offered in Callout Box 3.1.

Systematic withdrawals

- Pros
  - The process required to change providers prospectively with remaining assets is usually straightforward.
  - In-plan solutions increase assets under management, helping to reduce unit costs for administration.

- Cons
  - Retirees may think that the income is guaranteed for life when it really isn't. Not only might they deplete their savings, but they may be surprised to learn that it can happen.

# SECTION TEN: QUANTITATIVE ANALYSIS OF TRADEOFFS

This section presents the results of stochastic forecasts prepared by Dr. Wade Pfau, professor of retirement income at The American College. These forecasts demonstrate that a retiree's choice of a retirement income generator (RIG) significantly impacts the following amounts:

- Retirement income that a retiree will receive, both initially at retirement and throughout the retirement period
- Remaining and accessible wealth at various points throughout retirement

These forecasts:

- Illustrate and quantify some of the tradeoffs described in Sections 8 and 9.
- Provide examples of the types of analyses that plan sponsors might conduct as part of their due diligence when analyzing potential RIGs to implement in their retirement programs.

These forecasts are not intended to determine the optimal RIG solution (or combination of RIGs), or the most efficient asset allocation for invested savings. They are also not intended to cover all possible circumstances at retirement or to provide specific guidance for individuals on how to deploy their retirement savings or when to retire.

The analyses shown in this section represent institutionally priced retirement income solutions that are available through retirement plans. Retirement income solutions that are implemented on a retail basis, through IRA rollovers, for example, may have higher costs and fees that produce lower amounts of retirement income and/or remaining wealth. Section 11 estimates the advantages that institutional solutions can provide by comparing a few projections of institutional and retail retirement income solutions.

Figure 10.1 shows the annual amount of real retirement income (inflation-adjusted) that's expected to be generated from $100,000 of retirement savings for six RIGs that are readily available to retirement plan sponsors in today's marketplace:

- Systematic withdrawals, with an annual withdrawal amount equal to 4% of assets at retirement, adjusted each year thereafter for inflation using the Consumer Price Index (hereafter called systematic withdrawals–constant amount)
- Systematic withdrawals, with an annual withdrawal rate equal to 4% of assets at the beginning of each future year (hereafter called systematic withdrawals–constant percentage)
- Systematic withdrawals based on remaining life expectancies and the IRS-required minimum distribution (hereafter called systematic withdrawals–RMD)
- Immediate inflation-adjusted income annuity
- Immediate fixed income annuity (also known as single premium immediate annuity, or SPIA)
- Guaranteed minimum withdrawal benefit (GMWB) annuity

The projections for systematic withdrawals and the GMWB annuity assume assets are invested 60% in equities and 40% in fixed income assets throughout retirement.

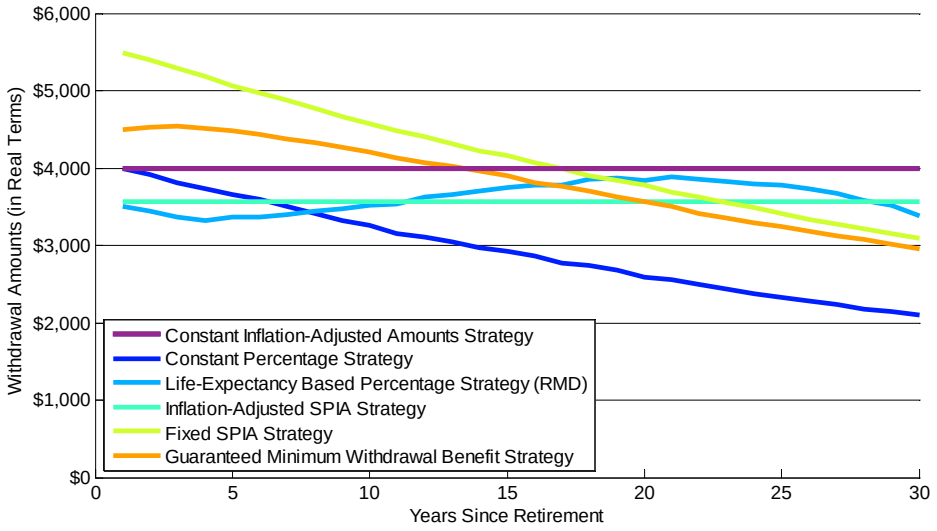
The economic assumptions and annuity purchase rates used for these forecasts reflect capital markets in April 2013. The arithmetic averages of the assumptions for real annual returns (estimated returns over the inflation rate) are 5.1% and 0.3% for stocks and bonds, respectively. The arithmetic average of the assumed annual rate of inflation is 2.1%. Appendix C contains details on these assumptions.

These forecasts demonstrate that the various RIGs produce significantly different amounts of income initially at retirement. During the retirement years, the various RIGs perform differently and produce significantly different amounts of retirement income, depending on whether investment returns and inflation align with expectations, or are above or below expectations.

Figure 10.1 compares forecasts of the real amounts *expected* (represented by the median results, or 50th percentile) under the six RIGs for retirements lasting 30 years for a married couple both age 65 at retirement with $100,000 in retirement savings.

Note that the projected retirement income amounts have been adjusted to reflect inflation. RIGs that adjust the income for inflation show a level line in the figure; RIGs that don't keep up with inflation show a declining line.

**Figure 10.1 Comparison of Forecasted *Expected* Retirement Incomes for Six Retirement Income Generators**




Source: Dr. Wade Pfau

***Analysis***

- The immediate fixed income and GMWB annuities provide the highest amounts of initial retirement income, but they decrease over time due to the effects of inflation. Inflation-adjusted annuities and two of the three systematic withdrawal methods adjust incomes for inflation and eventually deliver the highest amounts of inflation-adjusted income, surpassing fixed and GMWB annuities after 15 to 20 years.

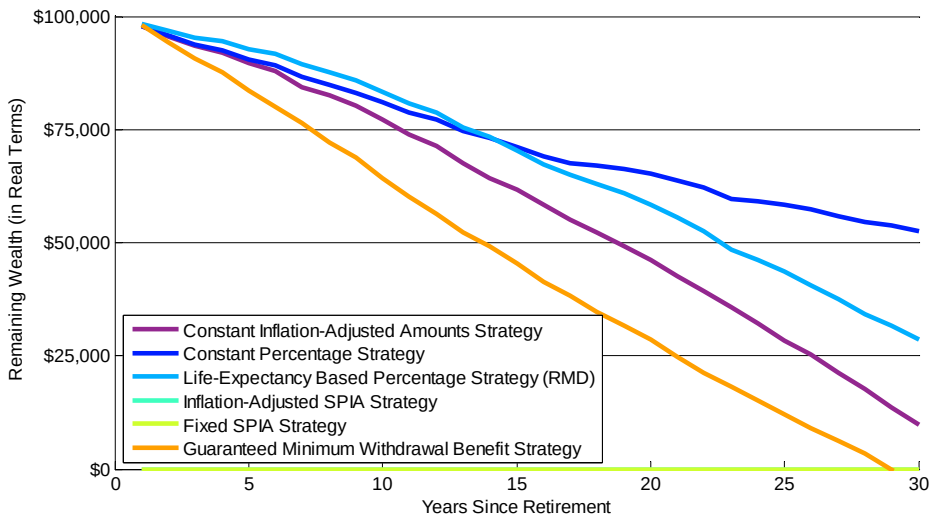
- Upon retirement, the annual amount of income ranges from $3,500, provided by systematic withdrawals–RMD, to $5,490, provided by an immediate fixed income annuity.

- After 15 years, the amount of income (expressed in today's dollars, adjusted for inflation since retirement) ranges from $2,918, provided by systematic withdrawals–constant percentage, to $4,158, provided by an immediate fixed income annuity.

- After 30 years, the amount of income (adjusted for inflation) ranges from $2,092, provided by systematic withdrawals–constant percentage, to $4,000, provided by systematic withdrawals–constant amount.

Figure 10.2 below compares the *expected* (median) amount of remaining and accessible wealth under the six RIGs for each year throughout a 30-year retirement.

**Figure 10.2 Comparison of Forecasted *Expected* Remaining Wealth for Six Retirement Income Generators**




Source: Dr. Wade Pfau

***Analysis***

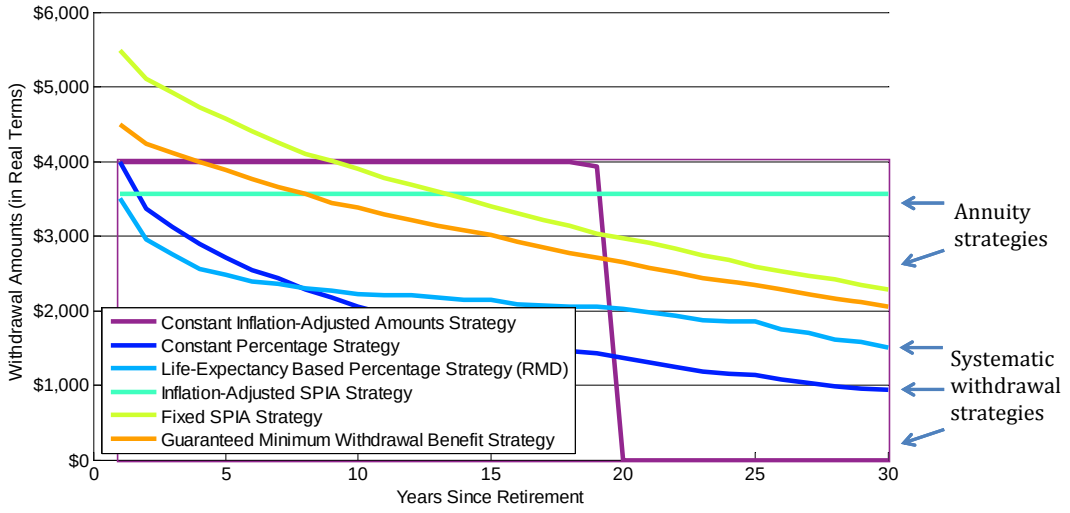
- There is no remaining wealth for immediate fixed income and inflation-adjusted annuities, due to the contractual nature of these annuities. These annuities pool the longevity risk by using the money received by annuitants who die before reaching their life expectancies to fund the benefits of annuitants who live beyond their life expectancies.

- The lowest amounts of income generated throughout retirement are produced by the RIG with the highest remaining wealth throughout retirement: systematic withdrawals–constant percentage. This demonstrates a "common sense" tradeoff with systematic withdrawals: Lower withdrawals for income during retirement provide a higher amount of remaining wealth at any point in time.

- GMWB annuities produce the lowest amount of remaining wealth and deplete assets after 28 years, but the income continues due to the guarantee of income inherent in this RIG. The insurance charges that are assessed against the account reduce the remaining wealth compared to the other RIGs; that's the price paid for combining access to remaining assets with a lifetime guarantee of an income stream.

Figures 10.1 and 10.2 present the *expected* results as represented by the median values from the stochastic forecast. Figure 10.3 shows the amount of annual retirement income generated by the six RIGs under *unfavorable* conditions regarding investment returns and inflation, as represented by the 10th percentile of results from the stochastic forecast. The initial amounts of retirement income in Figure 10.3 show the same expected amounts of retirement income as in Figure 10.1, but the projected amounts during retirement are much different.

**Figure 10.3 Comparison of Forecasted Retirement Incomes Under *Unfavorable* Scenario for Six Retirement Income Generators**




Source: Dr. Wade Pfau

***Analysis***

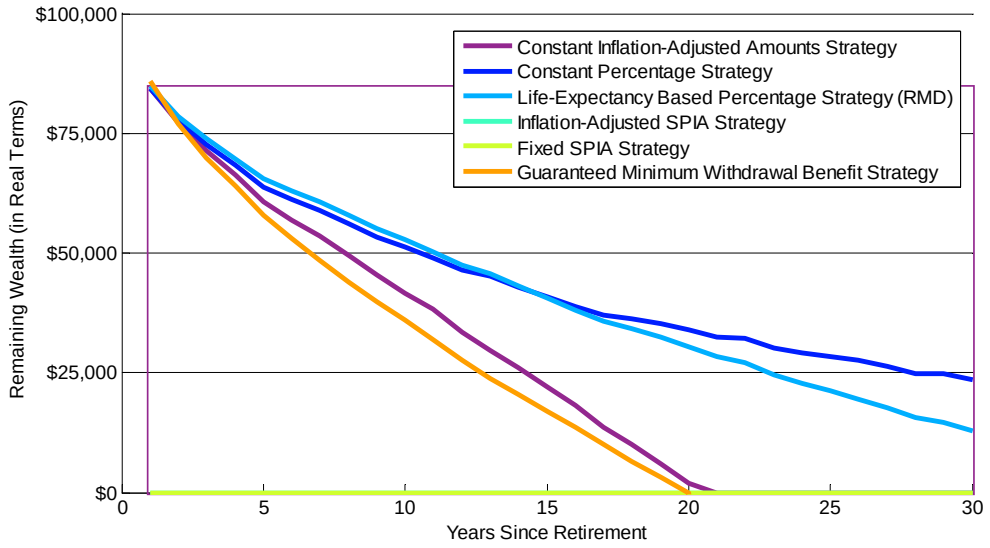
- The most dramatic result is that the systematic withdrawals–constant amount RIG exhausts retirement savings at 20 years and the projected retirement income drops to zero.

- The inflation-adjusted annuity provides the highest amount of real income at 30 years, followed by the immediate fixed income annuity. The reason is that the amounts of retirement income generated by these annuities aren't impacted by investment performance.

- Guaranteed products — annuities — provide higher retirement income under unfavorable conditions than solutions that rely on investing retirement assets.

Figure 10.4 shows the remaining wealth for the various RIGs under the *unfavorable* investment scenario, represented by the 10th percentile of results from the stochastic forecast.

**Figure 10.4 Comparison of Forecasted Remaining Wealth Under *Unfavorable* Scenario for Six Retirement Income Generators**



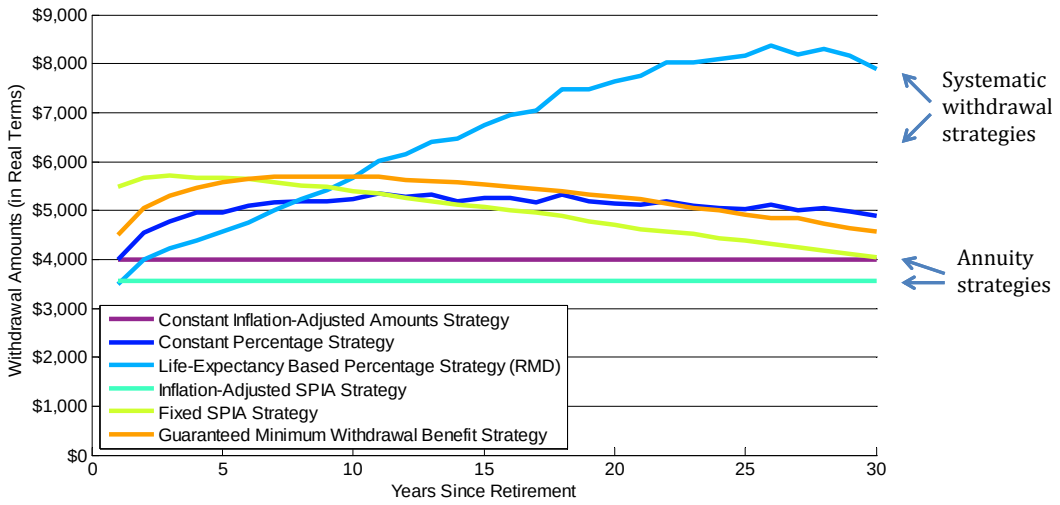

Source: Dr. Wade Pfau

***Analysis***

- Once again, there is no remaining wealth for immediate fixed income and inflation-adjusted annuities, due to the contractual nature of these annuities.
- As noted above for Figure 10.3, the systematic withdrawals–constant amount RIG exhausts savings at 20 years, since the withdrawal amounts aren't reduced to reflect the emerging poor investment experience.
- The GMWB solution also exhausts remaining wealth at 20 years, but income continues after then due to the operation of the income guarantee.
- Once again, the RIGs with the highest remaining wealth throughout retirement — systematic withdrawals–constant percentage and systematic withdrawals–RMD — produce the lowest amount of retirement income during retirement.

Figures 10.1 and 10.2 present the *expected* results and Figures 10.3 and 10.4 present the results under *unfavorable* investment conditions for the six retirement income generators from the stochastic forecasts. Figure 10.5 compares the amount of annual retirement income generated by the six RIGs under *favorable* conditions regarding investment returns and inflation, as represented by the 90th percentile of results from the stochastic forecast. The initial amounts of retirement income in Figure 10.5 are the same as the expected amounts in Figure 10.1 and the unfavorable amounts in Figure 10.3, but the projected amounts during retirement are much different.

**Figure 10.5 Comparison of Forecasted Retirement Incomes Under *Favorable* Scenario for Six Retirement Income Generators**



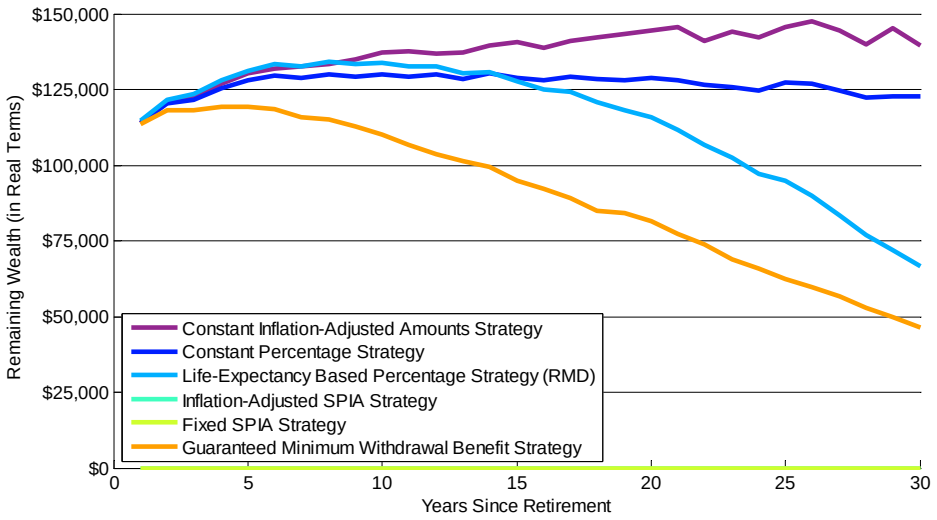

Source: Dr. Wade Pfau

### *Analysis*

- The highest amounts of income are produced by RIGs that invest retirement savings and determine the amount of retirement income as a percentage of invested assets.
- The lowest amounts of retirement income are produced by immediate fixed income and inflation-adjusted annuities and by systematic withdrawals–constant amount, because these methods don't adjust the amount of retirement income for investment performance.

Figure 10.6 shows the remaining wealth for the various RIGs under the *favorable* investment scenario, represented by the 90th percentile of results from the stochastic forecast.

**Figure 10.6 Comparison of Forecasted Remaining Wealth Under *Favorable* Scenario for Six Retirement Income Generators**




Source: Dr. Wade Pfau

***Analysis***

- Once again, there is no remaining wealth for immediate fixed income and inflation-adjusted annuities, due to the contractual nature of these annuities.
- The RIGs with the highest remaining wealth throughout retirement — systematic withdrawals–constant amount and systematic withdrawals–constant percentage — produce the lowest amount of income during retirement.
- GMWB annuities produce the lowest amount of remaining wealth, due to the insurance guarantee fees that are assessed against retirement savings.

Here are a few more observations based on the information supplied in these summary graphs on the tradeoffs facing retirees:

- Generating retirement income from savings is an exercise in "pay me now or pay me later," meaning RIGs that pay the highest amounts of income at the start of retirement often don't pay the highest amounts during the last half of retirement. With any of the systematic withdrawals, high initial withdrawal rates have a greater likelihood of exhausting assets in retirement.

- The RIGs examined use different allocations between equities and fixed income investments, which helps explain the differences in projected results. All the annuities except GMWB annuities are essentially invested in fixed income investments; this helps explain why they perform well in unfavorable scenarios and not as well in favorable scenarios. The systematic withdrawal strategies and GMWB annuities invest 60% of savings in equities; this helps explain why they perform well in favorable scenarios and not as well in unfavorable scenarios.

- If investment performance is favorable, a retiree sacrifices access to savings, the potential for a financial legacy, and the potential for increased income as the price for the guarantee offered by immediate fixed income or inflation-adjusted annuities. But both of these sources of retirement income are guaranteed for life, no matter how long the retiree lives and no matter what happens in financial markets.

- This analysis helps quantify the price for addressing key behavioral finance issues associated with annuities. An immediate fixed-income annuity always provides a higher retirement income than a GMWB annuity for the median and unfavorable scenarios. The initial income at retirement is 22% higher with the immediate fixed-income annuity; under the median scenario, this advantage reduces to 6% after 20 years and 5% after 30 years. The differences are greater under the unfavorable scenario. In the favorable scenario, the GMWB annuity begins providing a higher retirement income after six years, growing to an 11% advantage after 20 years. With the fixed-income annuity, however, there is no access to savings during retirement and no potential for leaving a legacy with unused funds, both of which are possible with a GMWB annuity. This helps quantify the price that a retiree will pay for a GMWB annuity that combines access to savings and the potential for a legacy combined with a guaranteed source of income.

Systematic withdrawals–constant percentage and systematic withdrawals–RMD never exhaust wealth, since a percentage is always applied to remaining assets to determine the amount of retirement income. Systematic withdrawals–constant amount exhausts savings under the unfavorable scenario. This demonstrates the danger of selecting a systematic withdrawal strategy that locks in withdrawal amounts at retirement and never makes adjustments for investment performance after retirement.

These analyses demonstrate that there's no "one size fits all" RIG. Retirees will experience different circumstances in these areas:

- Tolerance for risk regarding expected investment returns and inflation, depending in part on other sources of retirement income as well as the amounts of their nondiscretionary and discretionary living expenses
- Degrees of optimism or pessimism about the economy
- Life expectancies based on their family history and lifestyle
- The self-discipline required to manage a systematic withdrawal approach

Because of the tradeoffs described above, some retirees may want to deploy a portion of their savings to a source of guaranteed lifetime income and invest the remainder of their savings using a systematic withdrawal method. This may help them realize the advantages of each method while mitigating the disadvantages. For example, many participants may be reluctant to deploy all their savings to an immediate annuity with no access to savings; instead, they may prefer deploying a portion of their savings to an annuity and investing the remainder of their savings using one of the three systematic withdrawal strategies to generate retirement income.

One effective strategy that combines different RIGs could be to cover nondiscretionary living expenses with Social Security income and guaranteed sources of retirement income, and then invest remaining savings using a systematic withdrawal strategy to generate retirement income that covers discretionary living expenses.

For the reasons cited above, plan sponsors may best serve their retirees by offering a handful of distinct RIGs, with the ability to combine more than one solution. Plan sponsors could also offer a few packaged solutions that combine different RIGs and are designed to meet common goals and circumstances that participants may have.

See Appendix C for details on the assumptions of and detailed forecasts and analyses for each of these six RIGs. Also included are forecasts for a few additional applications of systematic withdrawals, as well as one graph that shows the potential for combining an immediate annuity with a systematic withdrawal method.

# SECTION ELEVEN: THE ADVANTAGES OF INSTITUTIONAL PRICING AND COMPETITIVE BIDDING

Plan sponsors are in a strong position to provide institutional (group) pricing that has the potential to deliver higher retirement incomes and/or remaining wealth, compared to retail pricing through IRA rollovers. This section estimates the advantages provided by institutional pricing for three RIGs:

- Immediate annuities
- GMWB annuities
- Systematic withdrawals

Immediate annuities

Plan sponsors can offer plan participants two possible advantages when delivering annuities:

1. Competitive bidding among insurance companies and then selecting the highest bidder offers the potential to increase retirement incomes for retirees by 10% to 20% for the same amount of savings used to purchase the annuity, according to one paper published by professionals familiar with annuity bidding.[16]
2. Reduction or elimination of transaction fees and commissions and group pricing has the potential to increase retirement incomes by 4% to 8% compared to retail annuity products, based on the analysis and experience of one professional who works extensively with both types of annuities.[17]

GMWB annuities

Here's a comparison of key features typically found in retail vs. institutional GMWB annuities:

- Total annual insurance and investment management charges for retail GMWB annuities are approximately 3.5% (350 basis points) vs. about 1.5-2.0% (150-200 basis points) for competitive institutional products.
- Initial amounts of guaranteed retirement income are often lower with retail products compared to amounts from institutional products. For example, in 2013, the initial amount of retirement income for a 65 year-old couple might be 4% of guaranteed contract value of assets (called the benefits value) for a retail product vs. 4.5% for an institutional product, resulting in an initial retirement income that is 12-1/2% higher with the institutional product.
- Insurance guarantee fees may apply to guaranteed benefits value for a retail product compared to the market value for an institutional product, resulting in higher charges when returns are unfavorable and the guaranteed value is higher than the market value.

Here's a summary of key results from the forecast that compares retail and institutional GMWB products under the expected scenario (50th percentile):

- The 12.5% gap in initial income mentioned above is projected to widen over the retirement period, eventually resulting in institutional solutions that produce retirement incomes roughly 16% higher than that of retail products after 10 years of retirement and 19% higher after 20 years.
- Remaining wealth is forecast to run out approximately six years sooner with the retail product compared to the institutional product, although the income continues due to operation of the insurance guarantee.

Similar differences exist for the unfavorable scenario represented by the 10th percentile of results and the favorable scenario represented by the 90th percentile of results. Figure C.11 in Appendix C compares the expected retirement income and remaining wealth (50th percentiles) for GMWB annuities on an institutional and retail basis.

Systematic withdrawals

Plan sponsors can provide investment funds to plan participants with annual charges for investment management and administration that are lower than retail mutual funds. In addition, retirees might work with financial advisors who provide guidance on asset allocation and withdrawal strategies, and charge a percentage of assets under management; annual charges of 1% (100 basis points) are common for advice provided on a retail basis. Charges for professional advice provided through institutional retirement plans can be 0.5% (50 basis points) or lower.

Note, however, that plan participants can find retail mutual funds with low investment and administrative charges, and they may choose not to incur the fees charged by financial advisors. In addition, some 401(k) plans — typically plans of small employers — offer funds with high fees.

With systematic withdrawals, the critical comparison is low fees vs. high fees incurred in any setting. With systematic withdrawals–constant amount, the amount of retirement income wouldn't be different with either approach, but high charges would reduce the amount of remaining wealth and increase the chance of outliving assets.

For example, systematic withdrawals–constant amount with an initial withdrawal rate of 4% is not forecasted to exhaust savings with institutional pricing under the expected scenario (50th percentile), but it is forecasted to exhaust savings after 27 years with the retail pricing. Under the unfavorable scenario (10th percentile), savings are forecast to be depleted two years sooner with retail pricing (at 18 years instead of 20 years with institutional pricing).

Figure C.12 in Appendix C provides details on these forecasts that compare remaining wealth with institutional and retail pricing for systematic withdrawals–constant amount.

With systematic withdrawals–constant percentage and systematic withdrawals–RMD, higher charges begin to reduce the amount of retirement income and remaining wealth in the first year; the gap widens for each year in the retirement period. Under the *expected* amounts (50th percentile), the retirement income is 10% higher at 10 years with the institutional pricing and 21% higher after 20 years. Similar differences exist for remaining wealth, and for the forecasts under *unfavorable* and *favorable* scenarios.

Figure C.13 in Appendix C provides details on these forecasts that compare retirement income and remaining wealth with institutional and retail pricing for systematic withdrawals—RMD.

# SECTION TWELVE: CHARACTERISTICS OF A SUCCESSFUL RETIREMENT PROGRAM

A successful program of retirement income options would have the goal of significant utilization by retiring employees, and would meet the variety of life circumstances and goals these employees may have. Such a program would have the following features:

- Communications to older employees — well before retirement — about the importance of making informed decisions regarding retirement income, including Social Security claiming strategies. Help them understand how much retirement income is realistic to expect from their savings, which in turn will help them decide when retirement is feasible.
- Institutionally priced retirement income options that provide the potential for higher income and/or remaining wealth to retirees, compared to retail solutions. Drive costs as low as possible.
- Retirement income generator(s) that have a reasonable chance of delivering lifetime retirement income.
- Communications about the pros and cons of the RIGs offered by the plan, including the risks associated with each RIG. A critical feature is the ability for retirees to compare the amounts of retirement income that are reasonable to expect under the different options.
- Decision support, including phone representatives, computer modeling, the option to work with an adviser, educational sessions, and informational materials.
- An easy path for retiring employees to select and implement a RIG or combination of RIGs that best meets their circumstances and goals.
- Flexibility for retirees to combine RIGs, so that the choice of a retirement income solution isn't "all or nothing," or the ability to make changes in RIGs during the retirement period.
- A default option that protects the plan sponsor from fiduciary liability and drives the employees to make informed choices. One default option that may meet these goals is to use the IRS required minimum distribution (RMD), a systematic withdrawal method that delays payments to age 70-1/2. At any time, the employee can make a conscious election about how to deploy remaining assets.
- Flexibility for the plan sponsor to change plan administrators or retirement income providers.

Retirement plan sponsors could significantly improve the retirement security of their employees by offering a basic and limited menu of RIGs in their defined contribution plans. Such a menu might include:

- Immediate fixed income annuities
- Systematic withdrawals through an installment feature or managed payout fund
- Payouts for fixed periods to facilitate deferring Social Security benefits
- Packaged solutions that combine annuities and systematic withdrawals to meet various circumstances and goals

Plan sponsors could also move beyond such a basic menu and offer more sophisticated income options, such as GMWB annuities, deferred annuities that provide protection in the years leading up to retirement, and/or packaged solutions that combine systematic withdrawals with longevity insurance. Recognize that offering too many RIGs has the potential to paralyze retirees' decision-making.

Some plan participants might feel comfortable making their own decisions regarding retirement income by studying the educational materials offered by the plan sponsor, plan administrator, and/or retirement income provider. Other participants might feel more comfortable working with a financial advisor to help them select the income options or combination of options offered by the plan, taking advantage of institutional pricing offered by the plan.

# SECTION THIRTEEN: PLAN SPONSOR ROADMAP AND CHECKLISTS

Plan sponsors should develop and document a systematic process for designing and implementing a retirement income program. Here's a checklist of steps that plan sponsors could follow to assess whether there's a business case to implement retirement income options in their plans and, if yes, how to proceed.

Build the business case

- Does the plan meet its purpose of attracting and retaining necessary talent, and facilitating healthy workforce succession?
- Are there significant numbers of employees over age 50 who are approaching retirement?
- Is there evidence that employees are making inappropriate decisions to deploy their retirement income, such as spending retirement income savings too rapidly, not doing enough planning or completing any assessment of retirement feasibility, and selecting expensive and/or poorly performing RIGs or providers?
- Is there evidence that employees are delaying retirement beyond the age at which they are still productive? Is this causing a challenge with workforce succession?
- Are older employees distracted by these issues, thus impacting their productivity? Have they asked for help?
- Would adding a retirement income program be perceived by employees as a low-cost way for an employer to enhance their benefit program? Would it help employers attract and retain talent?
- Does ERISA benefit counsel believe there are reasonable steps that a plan sponsor can take to manage and minimize fiduciary exposure when implementing a retirement income program?

Analyze potential solutions

- Ask the plan administrator about the potential RIGs that are practical to implement on their platform, including an installment payment feature. Identify applicable administrative issues, procedures, and costs with the various RIGs that are available.
- Determine the communications and decision support that is available to plan participants from the plan administrator or potential retirement income providers, and the extent to which it's desirable for the plan sponsor to supplement this material.
- Assess the circumstances of employees approaching retirement. Do they have a guaranteed income from a defined benefit plan? Is a lump sum option available? If yes, can they elect a partial lump sum (e.g. 50% as a lump sum and 50% as an annuity)? What is their level of financial sophistication?
- Estimate the amounts of retirement income that are reasonable to expect after expenses from the potential RIGs are deducted, initially at retirement and during the retirement period. Determine how these amounts may change due to unfavorable or favorable investment and inflation conditions. Are the withdrawal rates for systematic withdrawals or managed payout funds reasonably sustainable?
- Separately identify and estimate investment, administrative, and insurance costs that may apply to the potential RIGs. Under what circumstances can these charges change?
- Identify any conflicts of interest that may apply to providers of retirement income.
- Assess the vulnerability of retirees' income to the financial stability of retirement income providers. Are retirees' assets protected from the bankruptcy of the financial provider? Generally this is the case with systematic withdrawals but not with annuities. For annuities, assess the financial strength of sponsoring insurance companies and the potential protection offered by state insurance guaranty associations.
- Determine conditions, limitations, and costs that may be incurred if the plan sponsor changes or discontinues a retirement income solution.

See Callout Box 13.1 for a checklist of questions that a plan sponsor might ask a potential retirement income provider.

Implement and monitor

- Develop criteria for evaluating various retirement income generators and specific solutions offered by financial institutions (see Sections 7, 8, and 9).
- Assess potential retirement income solutions relative to criteria (see Section 8 and 9).
- Evaluate and consistently compare fees and services of various retirement income solutions offered by providers. What education and decision support do they provide? Do they provide call centers, and how are they staffed? What qualifications are required of their advisors?
- Select and implement a limited number of retirement income solutions that most efficiently meet the needs of plan participants.
- Periodically evaluate the solutions that are elected by retirees, collect feedback on their expectations and experiences, and assess new retirement income solutions that become available.

**Callout Box 13.1: Checklist of Questions for Retirement Income Providers**

The paper "Public Policy and Consumer Disclosure for the Immediate Annuity Market" by Kelli Hueler, Paula Hogan, and Anna Rappaport will be published in 2013 by the John Marshall Law School Review. The paper contains a checklist of questions in Appendix IV that a plan sponsor can ask potential retirement income providers about their retirement income solutions. The checklist is reproduced here with the permission of the authors.

- How is the investment risk treated? Who gets the benefit of the market upside, and who bears the risk of market losses?
- How is mortality risk treated? Can a participant run out of money?
- Is the income provided inflation indexed? Can a participant elect such protection?
- What benefits remain upon death?
- Is any liquidity available? What impact does this have on long-term income?
- Is an advice model included in the service provided?
- If an advice model is included, does it integrate guaranteed lifetime income during the spend-down period? How?
- What is the relationship between providers of advice and the organization offering the lifetime income alternatives?
- Are financial incentives paid to the plan administrator by any organization managing assets or providing advice? Is there any revenue sharing?
- Does the arrangement offer a variety of lifetime income alternatives? Can individuals make partial allocations to the different alternatives?
- How are risks, alternatives, and trade-offs described to participants? What formats are used to promote fair comparisons?
- If annuities are offered or purchased, is a competitive market approach used?
- Are retail products included in the retirement income alternatives provided?
- What due diligence is used in the selection or structuring of the retirement income alternatives offered?
- What fees and expenses are embedded in the options used? Are they disclosed to the plan sponsor with an analysis? Are they disclosed to participants and, if so, how?

# SECTION FOURTEEN: CALL TO ACTION

This paper makes the case that it is feasible and desirable for plan sponsors to implement a retirement income program in their defined contribution retirement plans. To that end, we have strived to:

- address common employer concerns and help remove barriers to implementation,
- describe possible retirement income generators and their pros and cons,
- discuss and demonstrate the tradeoffs that retirees must sort out when selecting a retirement income solution or combination of solutions that meets their goals and circumstances, and
- provide plan sponsors with a roadmap and checklists to implement a successful retirement income program that meets retirees' needs while addressing common plan sponsor concerns.

Plan sponsors and their advisors may want to refine their understanding by:

- exploring packages that combine different retirement income generators to optimize outcomes,
- analyzing whether it is desirable to offer protection of income in the years leading up to retirement, and
- learning about the behavioral finance factors that can influence retirees' decisions, and the strategies for addressing these factors.

The author and the Stanford Center on Longevity hope to complete additional research and papers to address these issues.

Plan sponsors and employers are uniquely positioned to deliver the capability for employees to convert their retirement savings into income, without any economic incentive that might bias individuals' decision-making. Implementing a retirement income program can be a low-cost way to deliver a significant benefit improvement, helping employers to attract and retain the talent they need to succeed.

Plan sponsors can serve their employees' diverse needs by offering retirement income generators to retiring employees, accompanied by decision support and assistance with implementation. This will deliver important benefits to individuals and society in general:

- Employees can retire with confidence and security, which will help them more fully enjoy their retirement years.
- It will help prevent employees from living in poverty in retirement after exhausting their savings.
- By offering institutional pricing, plan sponsors can significantly increase the amount of retirement income that participants might receive.

This paper describes how these highly desirable goals can be accomplished.

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# FIGURES

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- David Pagano

# APPENDIX A: SUMMARY OF RETIREMENT INCOME PRODUCTS AND SERVICES

- Annuity bidding service: An online service that a retiring employee can use to solicit bids for an immediate fixed-dollar or inflation-adjusted annuity among a group of insurance companies.

- Cash refund annuity: A lifetime income annuity that provides a cash payment to a named survivor in an amount equal to the difference between the original purchase price and the total of the income payments received. The purpose of the cash refund feature is to provide survivor benefits if the annuitant dies early in retirement, and to address potential concerns about loss of funds in the event of the early death of the annuitant. A cash refund feature adds to the cost of a lifetime income annuity, meaning that a fixed amount of savings buys a lower monthly income.

- Deferred fixed income annuity: An annuity for which an insurance company guarantees a fixed monthly payment that starts at a future date; this amount is paid for the life of the retiree, or for the life of the beneficiary if a joint life annuity is elected. Once the annuity is purchased, the ability of the participant to withdraw money from the annuity is limited or not available. Typical ages for starting income payments range from the late 50s to the early 70s. There may or may not be a death benefit in the event the annuitant dies before the monthly payments have started; such a death benefit will add to the cost of the annuity but is often necessary to address potential fears about loss of funds in the event of premature death. Post-retirement death benefits may be added, such as a joint and survivor annuity, cash refund annuity, or period certain and life annuity; all of these features add to the cost of the annuity, meaning that a given amount of retirement savings produces a lower monthly payment.

- Deferred variable annuity: An annuity in which monies are deposited with an insurance company and accumulated with interest or investment earnings. A minimum interest rate guarantee may apply, depending on the terms of the contract. At retirement, the accumulated value may be converted to a lifetime annuity using conversion factors specified in the contract. Monetary withdrawals are typically allowed, although penalties may apply or interest rate guarantees may be forfeited.

- Guaranteed lifetime withdrawal benefit (GLWB): See "Guaranteed minimum withdrawal benefit."

- Guaranteed minimum withdrawal benefit (GMWB): A hybrid insurance product that combines features of systematic withdrawals and an annuity. It can also provide protection against asset depreciation in the period leading up to retirement. In the accumulation phase, the guaranteed account value can increase if investment performance is favorable, but it won't decrease if performance is unfavorable; this has been called a "ratchet" feature. The period over which the guarantee is measured and applied is specified by the contract; the period is typically one year. In the payout phase, payments are guaranteed for the life of the retiree, and for the life of the beneficiary if a joint life annuity is elected. The ratchet feature also applies in the payout phase; the amount of monthly income may be adjusted upward if the underlying investment performance is favorable, but there is no downward adjustment if investment performance is unfavorable. Retirees can withdraw remaining savings at any time after the monthly income starts, although there may be penalties, adjustments, or loss of guarantees. In addition to investment management fees on invested assets, an insurance fee is assessed periodically against retirement savings to pay for the guarantees, both in the accumulation and payout phases.

- Immediate fixed income annuity (also known as single premium immediate annuity, or SPIA): An annuity for which an insurance company guarantees a fixed monthly payment that starts immediately; this amount is paid for the life of the retiree, and for the life of the beneficiary if a joint life annuity is elected. The income is fixed, and the insurer assumes all the investment risk. Variations include period certain and life annuities, and cash refund features. For a given dollar amount of purchase price, a single life annuity pays a higher monthly income than a joint life annuity, period certain and life annuity, or cash refund annuity; this is the price paid for the death benefit. Once the annuity is purchased, the ability of the participant to withdraw money from the annuity is limited or non-existent. However, in return for forfeiting control over capital, annuitants enjoy a higher income than they would obtain from a portfolio of bonds. An immediate fixed income annuity often offers the highest amount of retirement income at the start of retirement that is guaranteed for the life of an annuitant.

- Immediate inflation-adjusted annuity: An immediate annuity that is adjusted periodically according to a measure of inflation, typically the Consumer Price Index (CPI) or by a fixed percentage.

- Immediate variable income annuity: An annuity for which an insurance company guarantees a lifetime monthly payment that starts immediately upon purchase; this amount is paid for the life of the retiree, or for the life of the beneficiary if a joint life annuity is elected. The amount of income is adjusted periodically according to the performance of an underlying portfolio of stocks and/or bonds. The insurer manages and offers a set of portfolios, and the owner chooses an investment option from the available portfolio. Some annuities may provide minimum income guarantees. Once the annuity is purchased, the ability of the participant to withdraw money from the annuity is limited or not available.

- Joint and survivor annuity: An annuity in which retirement income is continued to a surviving beneficiary. The amount is typically a specified percentage of the income while both the participant and the beneficiary are alive.

- Longevity insurance (also known as longevity annuity or advanced life deferred annuity): A fixed lifetime deferred income annuity that is purchased at retirement but starts income payments at an advanced age, such as 80 or 85, which are typically much later ages than the ages at which deferred fixed income annuities begin. With the least expensive form of longevity insurance, there are no death benefits paid in the event of death before the annuity starting age. Some policies offer death benefits in this event, but such a benefit increases the cost of the annuity. Longevity insurance is typically combined with a systematic withdrawal strategy or managed payout fund that provides retirement income from the date of retirement until the age that the deferred annuity payments begin.

- Managed payout fund: A mutual fund from a mutual fund company that invests retirement savings and pays out principal and investment earnings according to a specified strategy, such as an endowment method. Payments are intended to last indefinitely or for a specified period, but there is no guarantee if investment experience is poor and/or if the retiree lives well beyond life expectancies.

- Period certain only annuity: An annuity for which retirement income is paid for a specified period (typically 5, 10, or 15 years), even if the primary participant dies within the specified period. No payments are made after the period ends, even if the participant is alive.

- Period certain and life annuity: An annuity for which retirement income is paid for the life of the participant. The income is continued for a specified period (typically 5, 10, or 15 years) even if the annuitant dies before the end of the period.

# APPENDIX B: GLOSSARY

- Annual payout rate (see "Payout rate")

- Cash balance plan: A defined benefit plan that defines the benefit as an account that is accumulated with contribution and guaranteed interest credits. Benefits at termination or retirement are typically paid in a lump sum.

- Four percent rule: A systematic withdrawal–constant amount method of generating retirement income with an initial payout rate of 4%. The income is increased for inflation each year. The 4% payout rate is a “rule of thumb” often cited by financial analysts and planners as a sustainable withdrawal rate with a low chance of failure for retirements lasting 30 years. The four percent rule has been questioned lately due to the current low interest rate environment and the lack of flexibility to adjust withdrawal amounts to reflect investment experience.

- Installment payments: A common feature in defined contribution plans that periodically pays (monthly or quarterly) a fixed amount or a constant percentage of assets. The withdrawal amount or percentage can be changed prospectively. There is no guarantee that savings won’t be exhausted.

- Managed payouts: See "systematic withdrawals."

- Monte Carlo analyses: See "stochastic forecasts."

- Payout rate: The initial, annual amount of retirement income, expressed as a percentage of assets at retirement.

- Required minimum distribution (RMD): A systematic withdrawal method using the life expectancy method in accordance with IRS requirements. The RMD is used to define minimum required withdrawals from tax qualified retirement plans and deductible IRAs beginning at age 70-1/2. The RMD is a legal requirement of tax-qualified plans for taxation purposes and is not a payment amount that is “recommended” by the government.

- Retirement income generator (RIG): A strategy, product, or service that converts retirement savings into periodic income, typically with the goal that the income will last for the life of the retiree and beneficiary, if applicable.

- State insurance guaranty associations: Most states provide limited guarantees of insurance and annuity products sold in their state. The guarantee limits vary by state and typically range from $100,000 to $250,000. The purpose is to protect policyholders from bankruptcy of an insurance company.

- Stochastic forecasts (also known as "Monte Carlo projections"): Simulations of future amounts of retirement income and remaining wealth for a given retirement income generator under a variety of possible future economic scenarios regarding rates of return and inflation. Probabilities are assigned to different projected outcomes.

- Sustainable withdrawal rate: A systematic withdrawal strategy that has a low probability of exhausting savings during a retiree’s life (and the life of the beneficiary, if applicable).

- Systematic withdrawals (also known as "managed payouts"): A method of generating retirement income in which retirement savings are invested, and principal and investment earnings are paid out according to a specified strategy, such as constant amount, endowment method (constant percentage), or life expectancy method.

- Systematic withdrawals–constant amount method: A systematic withdrawal strategy for generating retirement income that periodically pays out a constant dollar amount. Typical payment periods are monthly or quarterly. The dollar amount may be adjusted periodically to reflect inflation, typically annually.

- Systematical withdrawals–constant percentage method (also known as "endowment method"): A systematic withdrawal strategy for generating retirement income that periodically pays out a constant percentage of assets at the time of payment. Typical payment periods are monthly or quarterly. This method adjusts the retirement income amounts up or down to reflect investment performance during retirement.

- Systematic withdrawals–life expectancy method: A systematic withdrawal strategy for generating retirement income that periodically pays out a constant dollar amount during a given year, where the amount is calculated such that it's expected to be paid for the remaining life expectancy at the time of calculation. The payment is adjusted annually to reflect the remaining life expectancy of the participant and the remaining assets at the time of adjustment. Typical payment periods are monthly or quarterly. This method adjusts the retirement income amounts up or down to reflect investment performance during retirement.

# APPENDIX C: DETAILS OF STOCHASTIC FORECASTS OF RETIREMENT INCOME SOLUTIONS

Stochastic forecasts, also known as Monte Carlo projections, simulate future amounts of retirement income and remaining wealth for a given retirement income generator (RIG) under a variety of possible future economic scenarios taking into account rates of return and inflation. The forecasts project the annual amounts of real retirement income, adjusted for inflation, and the remaining amounts of real wealth for retirements lasting up to 30 years. Probabilities (percentile rankings) are assigned to the different projected outcomes.

These forecasts use assumptions for the rates of return on stocks and bonds and anticipated inflation, along with assumptions for the possible variations in these returns. The forecasts attempt to mimic reality by building in randomness in the projected returns and inflation, and by consistently correlating the movement of returns in stocks, bonds, and inflation based on historical patterns.

The assumptions are developed after reviewing historical returns for various asset classes, and then making adjustments for how future returns might deviate from historical returns based on the judgment of the professional preparing the forecasts. For example, in early 2013, interest rates on bonds were at historical lows, and it's most likely unrealistic to expect returns on bonds in the near future that are close to historical averages. The assumptions used in this report have been adjusted to reflect expected returns on stocks and bonds prevalent in late 2012 and early 2013.

Table C.1. Assumptions Used for Stochastic Forecasts

| | Real Returns | | | Correlation Coefficients | | |
|---|---|---|---|---|---|---|
| | Arithmetic Mean | Geometric Mean | Standard Deviation | Stocks | Bonds | Inflation |
| Stocks | 5.1% | 3.1% | 20.0% | 1.0 | 0.1 | -0.2 |
| Bonds | 0.3% | 0.2% | 7.0% | 0.1 | 1.0 | -0.6 |
| Inflation | 2.1% | 2.0% | 4.2% | -0.2 | -0.6 | 1.0 |

The forecasts used in this report were prepared by Dr. Wade Pfau, professor of retirement income at The American College. He used the assumptions shown in Table C.1, which are documented in his article in the Fall 2012 *Journal of Financial Planning* titled "A Broader Framework for Determining an Efficient Frontier for Retirement Income." Returns for stocks and bonds are real amounts, after adjusting for inflation.

The assumed returns on stocks are representative of returns on the S&P 500, and the returns on bonds are representative of returns on intermediate-term government bonds. No over-performance or underperformance of returns relative to index returns is assumed from active management.

The forecast projects the retirement income and remaining wealth amounts for a married couple both aged 65 with $100,000 in retirement savings at retirement.

The asset allocation for systematic withdrawal strategies and guaranteed minimum withdrawal benefit (GMWB) annuities is assumed to be 60% stocks and 40% bonds throughout retirement.

Systematic withdrawal strategies for institutional solutions are assumed to experience annual charges of 0.50% (50 bps) of assets each year for investment and administrative expenses. Annual charges of 1.50% (150 bps) are assumed for retail solutions.

Annuity purchase rates for fixed and inflation-adjusted immediate income annuities were obtained in early April 2013 using purchase rates from Income Solutions, an annuity bidding service. These purchase rates, expressing the amount of initial retirement income as a percentage of savings, are as follows:

- Fixed income 100% joint and survivor annuity: 5.49%
- Inflation-adjusted 100% joint and survivor annuity: 3.57%

The following assumptions were used to prepare the projections for GMWB institutional annuities:

- Initial annual amount of retirement income is 4.5% of assets at retirement for a 100% joint and survivor annuity. This rate is representative of rates offered by GMWB annuities in 2013 that are prevalent for tax qualified retirement plans.
- Investment, administrative, and insurance charges are 1.50% (150 bps) of assets each year, applied to the market value.

The following assumptions were used to prepare the projections for GMWB retail annuities:

- Initial annual amount of retirement income is 4% of assets at retirement for a 100% joint and survivor annuity.
- Investment and administrative charges are 2.25% (225 bps) of assets each year, applied to the market value.
- Annual insurance guarantee fee is 1.25% (125 bps), applied to the guaranteed benefits value.

Note that the above assumptions regarding charges for investment expenses, insurance fees, and annuity purchase rates represent competitive levels in 2013; fees and charges that are higher than these amounts would produce lower values of projected retirement income and remaining wealth.

This paper's author and Dr. Pfau acknowledge that other reasonable assumptions regarding investment returns, inflation, asset classes, asset allocations, and expense charges exist that may produce different results. Plan sponsors are encouraged to explore the assumptions that are most representative of their expected experience and the actual retirement income options that they are considering.

The following figures show stochastic forecasts for each of the six RIGs that Section 10 compared and summarized, as follows:

- Figure C.1: Systematic withdrawals with an annual withdrawal amount equal to 4% of assets at retirement, adjusted each year thereafter for inflation using the Consumer Price Index (herein called systematic withdrawals–constant amount)
- Figure C.2: Systematic withdrawals with an annual withdrawal rate equal to 4% of assets at the beginning of each future year (herein called systematic withdrawals–constant percentage)
- Figure C.3: Systematic withdrawals based on remaining life expectancies and the IRS required minimum distribution (herein called systematic withdrawals–RMD)
- Figure C.4: Immediate inflation-adjusted annuity
- Figure C.5: Immediate fixed income annuity
- Figure C.6: Guaranteed minimum withdrawal benefit (GMWB) annuity

The graphs for each RIG show the 10th, 25th, 50th, 75th, and 90th percentiles of results. The 90th percentile lines represent the highest values of income and remaining wealth (most favorable scenarios regarding investment performance and inflation), and the 10th percentile lines represent the lowest values (least favorable scenarios). As an example to illustrate how to interpret the results, the values shown for the 75th percentile mean that 75% of the simulations produced retirement incomes below those values. Similarly for the projections of remaining wealth, the values shown for the 25th percentile mean that 25% of the simulations produced remaining wealth amounts below those values.

Following the above graphs are additional forecasts for these RIGs or combination of RIGs:

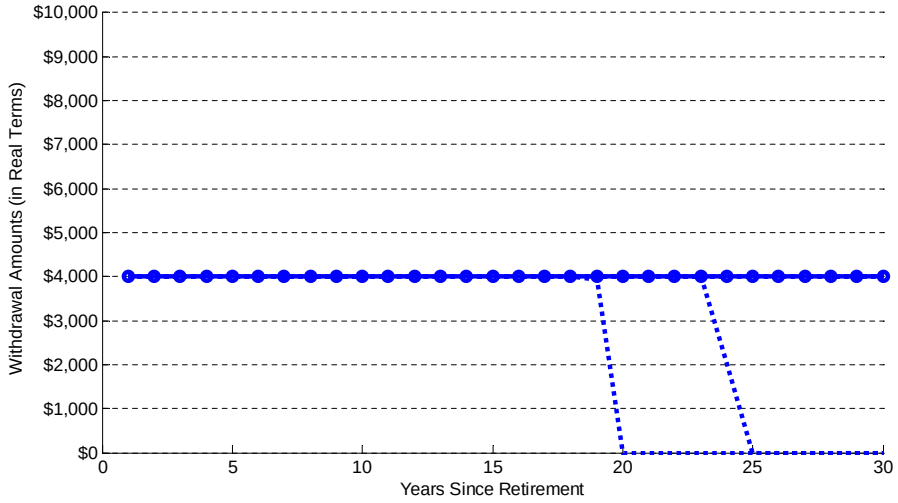
- Figure C.7: Upon retirement, half of all retirement savings is applied to purchase an inflation-adjusted immediate annuity, and the remainder of savings is applied to systematic withdrawals–RMD.
- Figure C.8: Systematic withdrawals–constant amount, using an initial withdrawal amount of 3.5% of assets at retirement.
- Figure C.9: Systematic withdrawals–constant amount, using an initial withdrawal amount of 5% of assets at retirement.
- Figure C.10: Systematic withdrawals–constant amount, using an initial withdrawal amount of 6% of assets at retirement.

Following the above graphs are additional forecasts to compare institutional and retail pricing:

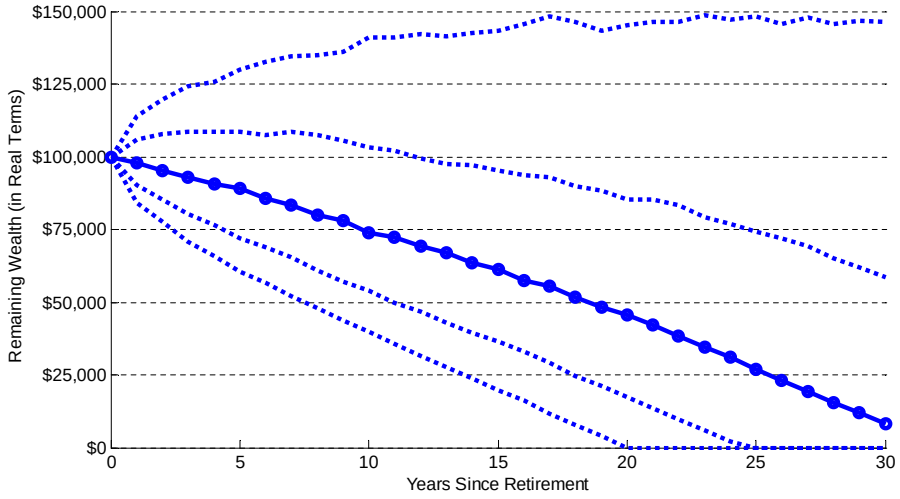
- Figure C.11: GMWB annuities, comparison of *expected* retirement income and *expected* remaining wealth at 50th percentile.
- Figure C.12: Systematic withdrawals–constant amount, using an initial withdrawal amount of 4% of assets at retirement. Comparison of remaining wealth under *expected* scenario (50th percentile) and *unfavorable* scenario (10th percentile).
- Figure C.13: Systematic withdrawals–RMD, comparison of *expected* retirement income and *expected* remaining wealth at 50th percentile.

**Figure C.1 Systematic Withdrawals**
**Annual Withdrawal Amount Equal to 4% of Assets at Retirement**
**Adjusted Each Year Thereafter for Inflation Using the CPI**

Retirement Income




Remaining Wealth



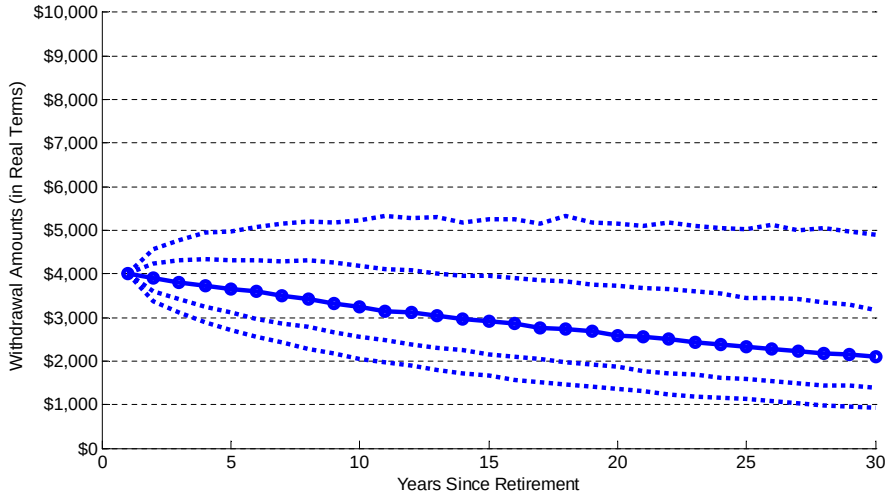

Source: Dr. Wade Pfau.

***Analysis***

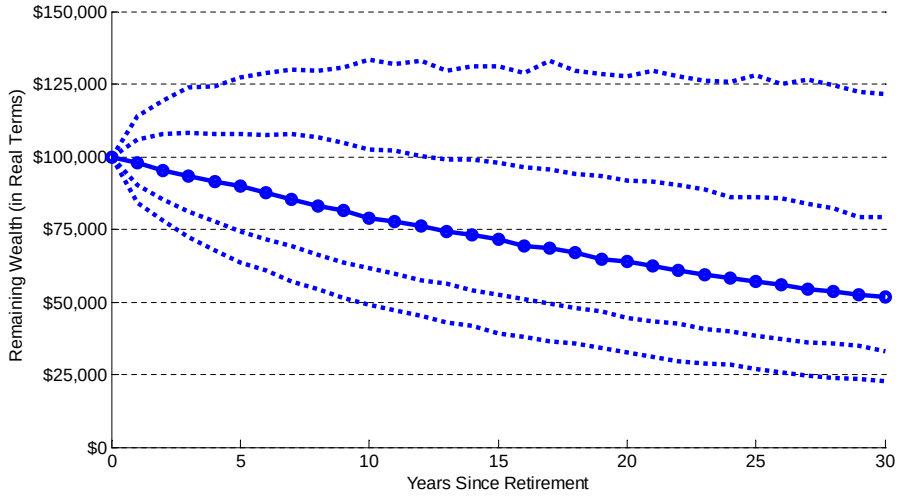
- With this RIG, the amount of annual retirement income is fixed at 4% of beginning assets, adjusted for inflation. These amounts aren't adjusted for favorable or unfavorable investment results, and they're paid indefinitely or until assets are exhausted. As such, the projections of real retirement incomes show flat lines for the 50th, 75th, and 90th percentiles. Under the 25th percentile, assets are exhausted by 25 years and the income (and remaining wealth) falls to zero. Under the 10th percentile, assets are exhausted by 20 years.
- Remaining wealth approaches zero at 30 years under the 50th percentile. Under the most favorable scenario (90th percentile), investment returns are sufficient to fund the retirement income stream and increase remaining wealth.

**Figure C.2 Systematic Withdrawals**
**Annual Withdrawal Amount Equal to 4% of Assets**
**at the Beginning of Each Future Year**

Retirement Income




Remaining Wealth



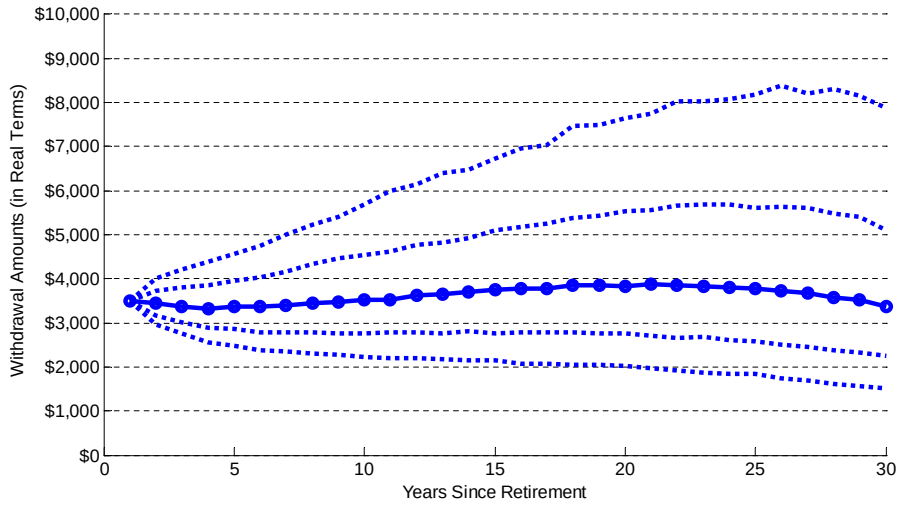

Source: Dr. Wade Pfau.

***Analysis***

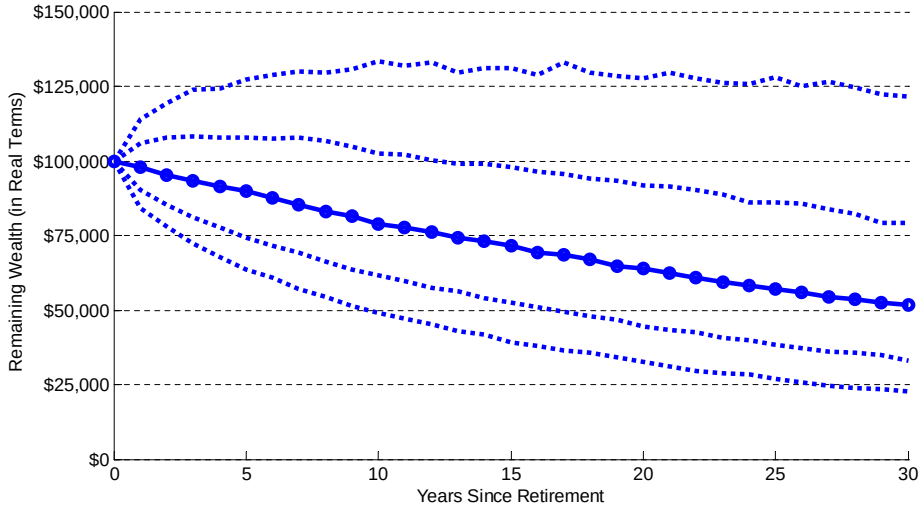
- Because the annual income is calculated as 4% of the value of assets at the beginning of each year, the amounts of income and remaining wealth never fall to zero. The income is adjusted up or down each year to reflect cumulative investment performance, building in a self-adjusting safety mechanism to avoid exhausting retirement savings.
- In all but the 90th percentile, the real income declines over time, because the amount of real withdrawals, adjusted for inflation, exceeds the amount of real investment returns. In other words, the projected real returns are less than 4% of assets.

**Figure C.3 Systematic Withdrawals Based on Remaining Life Expectancies with IRS Required Minimum Distribution**

Retirement Income




Remaining Wealth



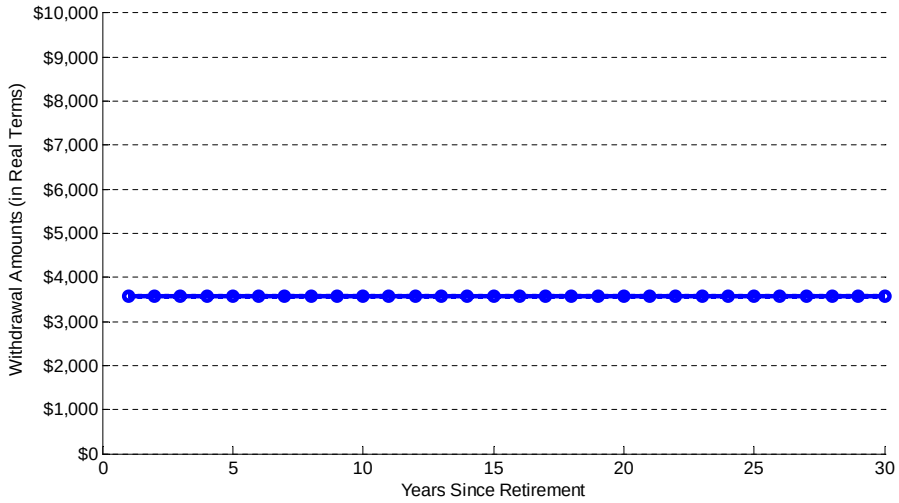

Source: Dr. Wade Pfau.

***Analysis***

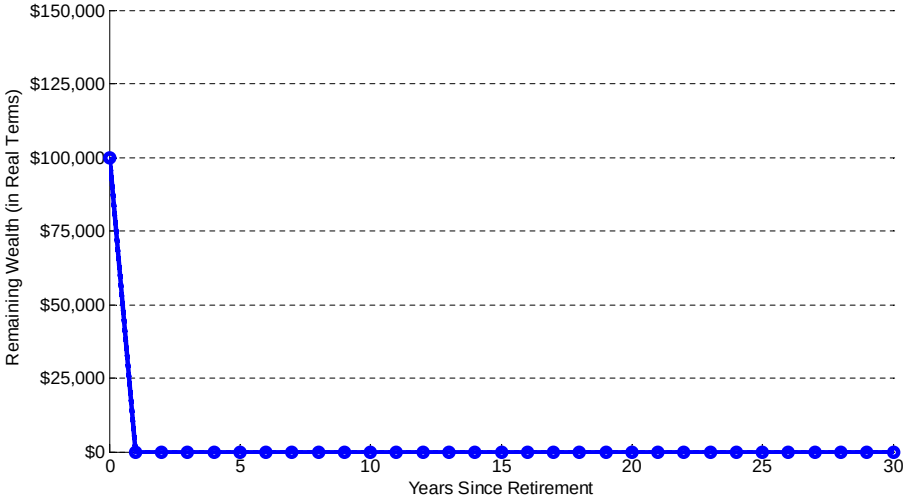
- The IRS required minimum distribution (RMD) mandates withdrawals from tax-qualified accounts beginning at age 70-1/2. The RMD is determined as the account balance at the beginning of each year, divided by the remaining life expectancy according to IRS tables. The annual payout rate at age 70 is 3.65% of assets, increasing each year to 5.35% at age 80 and 8.77% at age 90. For the purpose of this forecast, the annual payout rates from ages 65 to 70— before the RMD applies — are assumed to be 3.5% of assets each year.
- This RIG may better meet retirement objectives than the previous two systematic withdrawal methods. The projections show expected retirement income patterns that are level when adjusted for inflation, and also show that plan assets aren't exhausted under unfavorable scenarios.

**Figure C.4**
**Immediate Inflation-Adjusted Annuity**

Retirement Income




Remaining Wealth



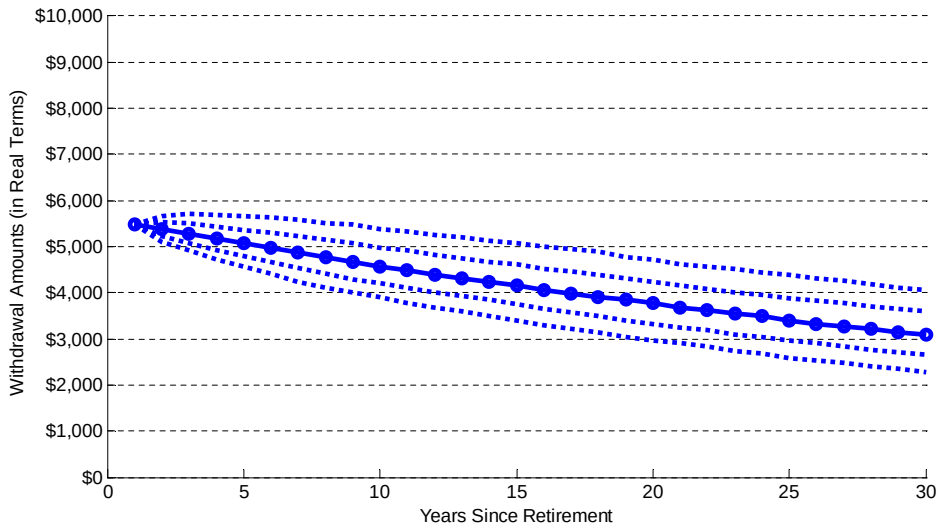

Source: Dr. Wade Pfau.

***Analysis***

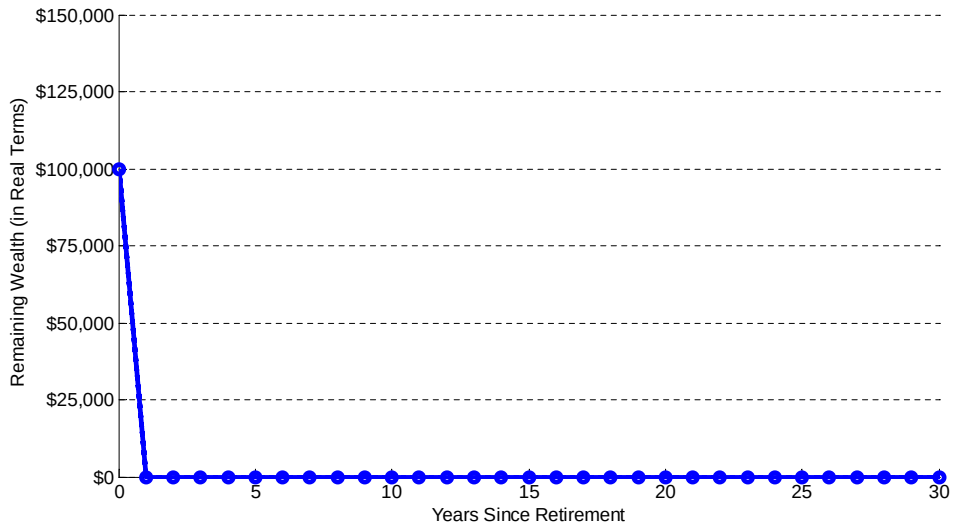
- Because the income amount is adjusted for inflation and isn't affected by capital market performance, the income amounts are the same under all economic scenarios.
- Because of the contractual nature of this type of annuity, there is no accessible wealth or remaining wealth at death. This is the price paid for the lifetime guarantee of inflation-adjusted income.

**Figure C.5**
**Immediate Fixed Income Annuity**

Retirement Income




Remaining Wealth



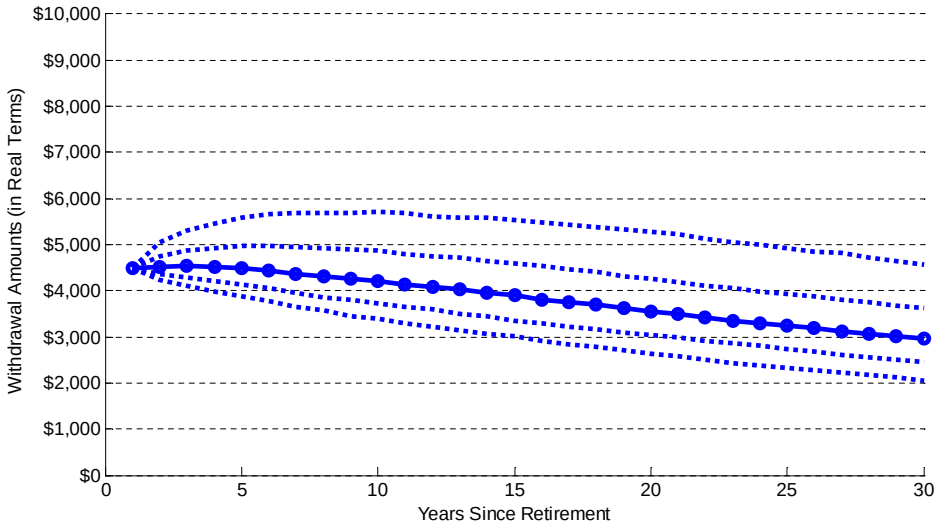

Source: Dr. Wade Pfau.

***Analysis***

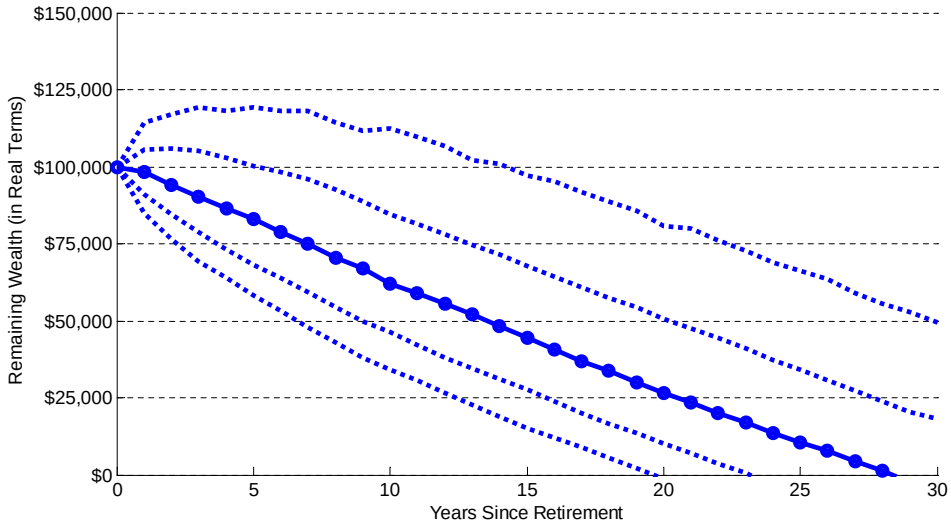
- Because the income amount is fixed and isn't adjusted for inflation, the real amounts decline over time. Scenarios with higher inflation will show steeper declines. This RIG produces the highest initial amount of retirement income, due to the pooling of longevity risk and fixed monthly payment.
- Because of the contractual nature of this type of annuity, there is no accessible wealth or remaining wealth at death. This is the price paid for the lifetime guarantee of a fixed income.

**Figure C.6**
**Guaranteed Minimum Withdrawal Benefit (GMWB) Annuity**

Retirement Income




Remaining Wealth



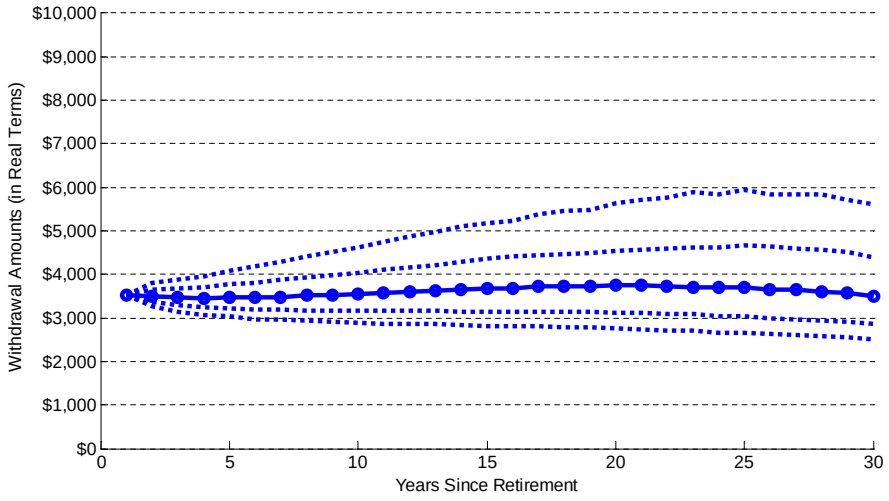

Source: Dr. Wade Pfau.

***Analysis***

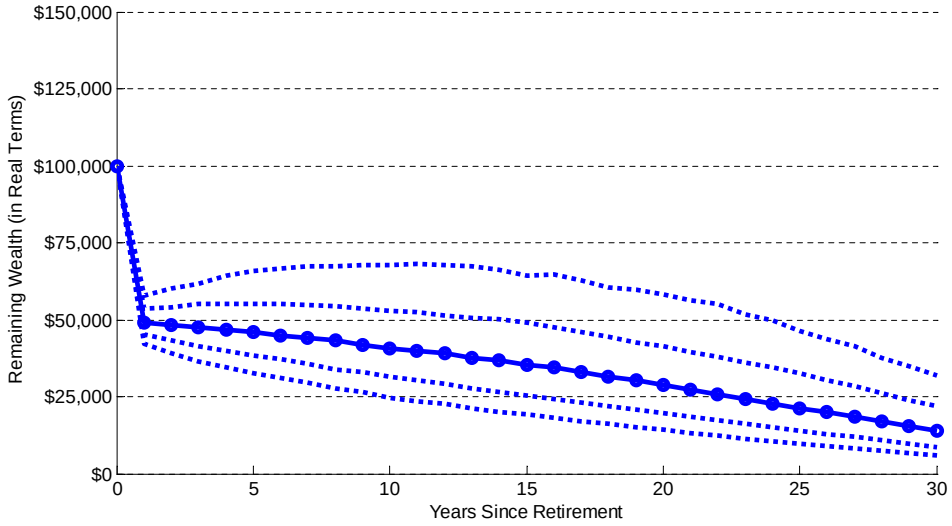
- Under all but the most favorable scenarios, the real amounts of retirement income decline over time. This is because the projected net effect of investment returns and insurance guarantee fees are unable to keep pace with inflation.
- This is the only form of guaranteed annuity that was analyzed with the possibility for accessible wealth and remaining wealth at death. However, these amounts are less than with systematic withdrawal methods due to the application of the insurance guarantee fees. Remaining wealth is exhausted under expected and unfavorable investment scenarios, but the retirement income continues due to the insurance guarantee.

**Figure C.7 50/50 Method**
**50% of Savings Is Applied to Purchase an Inflation-Adjusted Annuity, and 50% Is Applied to Systematic Withdrawals–RMD**

Retirement Income




Remaining Wealth



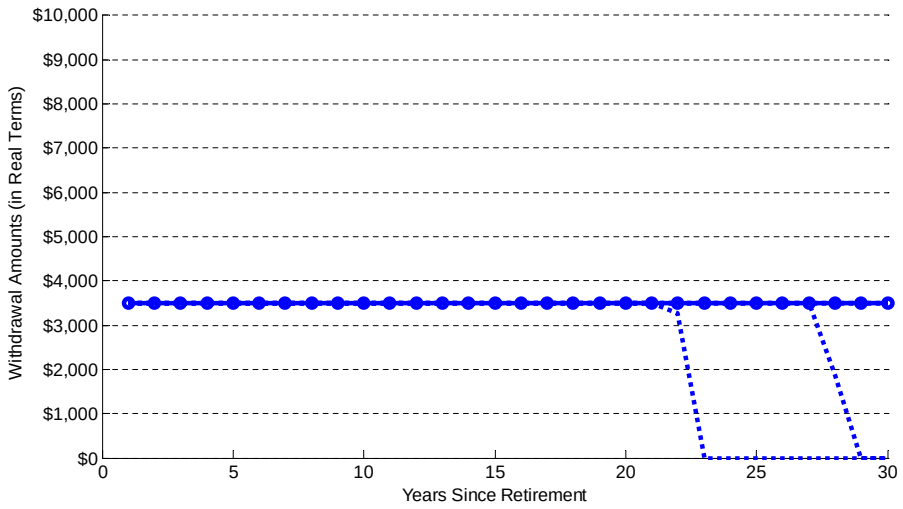

Source: Dr. Wade Pfau.

***Analysis***

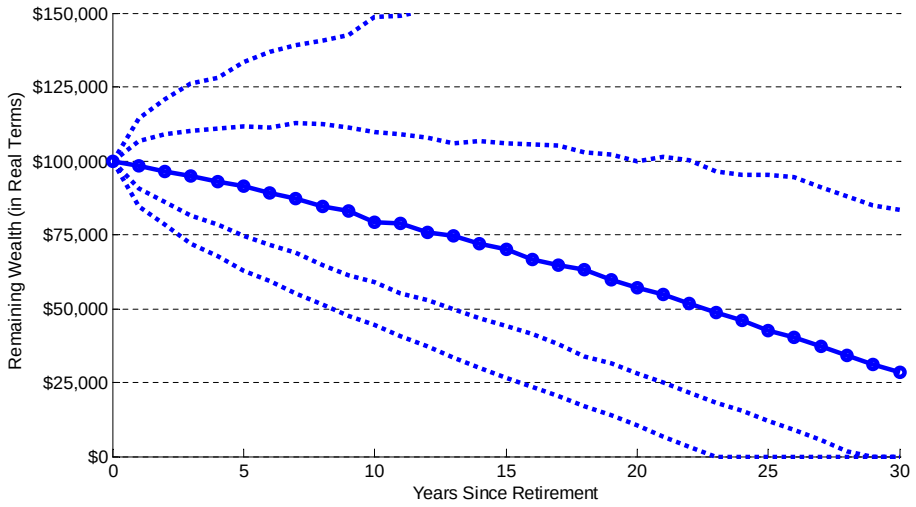
- This chart shows how a combination strategy might be an effective compromise between annuities and systematic withdrawals. The amount of retirement income is somewhat constant in real terms and doesn't exhaust savings under unfavorable scenarios.
- This combination solution has some accessible wealth and remaining wealth at death, unlike fixed and inflation-adjusted annuities.
- The sole purpose of this chart is to demonstrate the possibility for a combined solution and is not intended to show an optimal combination solution.

**Figure C.8 Systematic Withdrawals**
**Annual Withdrawal Amounts Equal to 3.5% of Assets at Retirement**
**Adjusted Each Year Thereafter for Inflation Using the CPI**

Retirement Income




Remaining Wealth



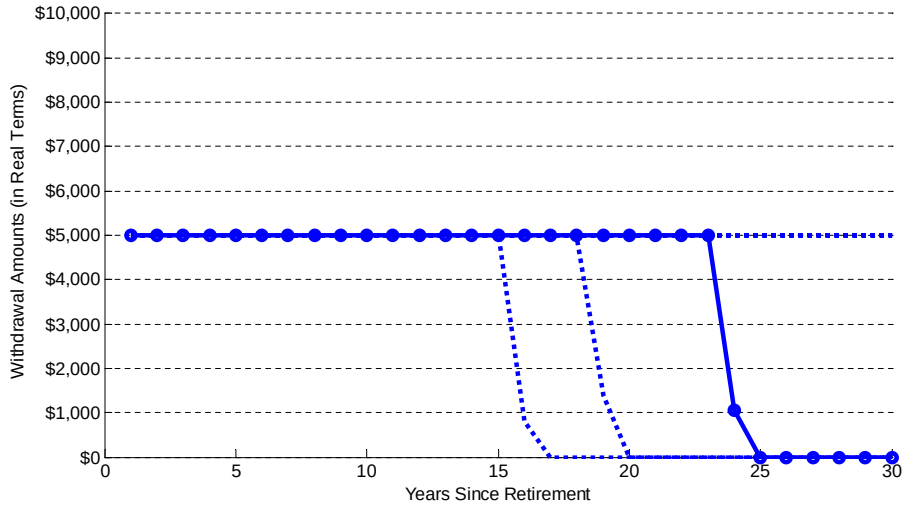

Source: Dr. Wade Pfau.

***Analysis***

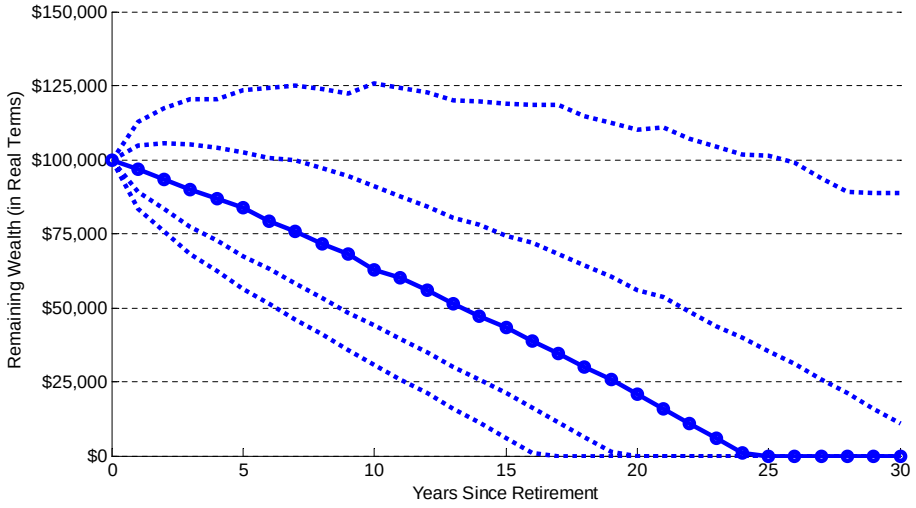
- With this RIG, the amount of annual retirement income is fixed at 3.5% of beginning assets, adjusted for inflation. This represents an adjustment of the popular four percent rule to reflect that current investment conditions, with low interest rates, may be less favorable than the historical period upon which the four percent rule is based.
- The income amounts aren't adjusted for favorable or unfavorable investment results, and they're paid indefinitely or until assets are exhausted. As such, the projections of real retirement incomes show flat lines for the 50th, 75th, and 90th percentiles. Under the 25th percentile, assets are exhausted by 28 years and the income (and remaining wealth) falls to zero. Under the 10th percentile, assets are exhausted by 23 years. The projected exhaustion dates are later than with a 4% withdrawal method.
- Under the 90th percentile, investment returns are sufficient to fund the retirement income stream and increase remaining wealth. Under the 75th percentile, remaining wealth declines slightly throughout the retirement period.

**Figure C.9 Systematic Withdrawals**
**Annual Withdrawal Amounts Equal to 5% of Assets at Retirement Adjusted Each Year Thereafter for Inflation Using the CPI**

Retirement Income




Remaining Wealth



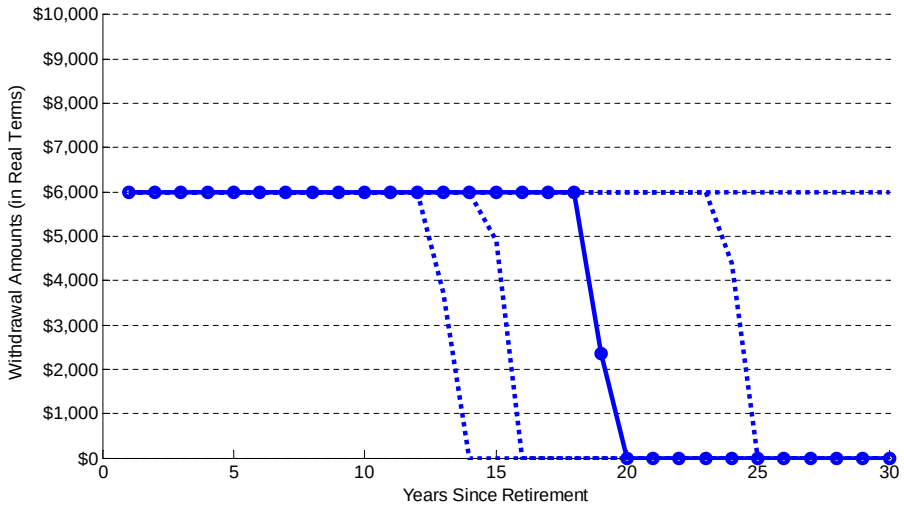

Source: Dr. Wade Pfau.

***Analysis***

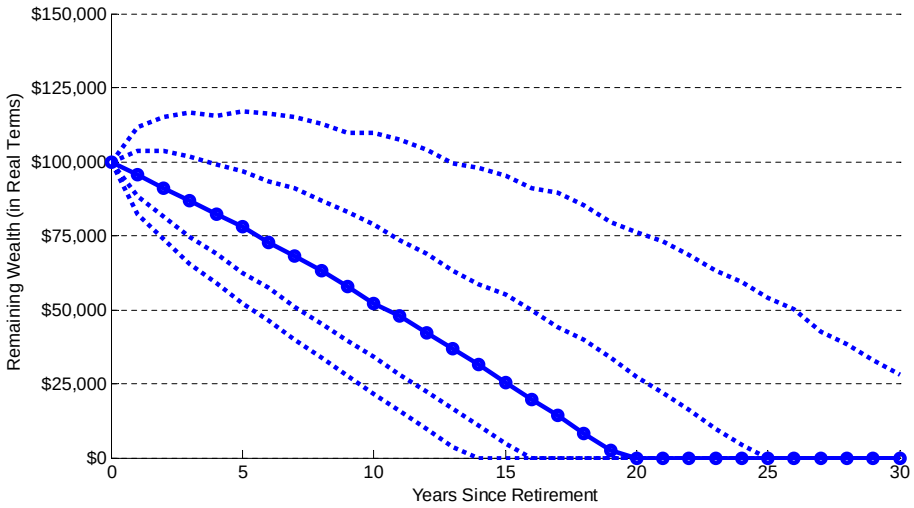
- With this RIG, the amount of annual retirement income is fixed at 5% of beginning assets, adjusted for inflation. The purpose of this graph and Figure C.10 is to illustrate the risk of systematic withdrawal amounts with high withdrawal rates and no adjustment to reflect investment experience.
- The income amounts aren't adjusted for favorable or unfavorable investment results, and they're paid indefinitely or until assets are exhausted. As such, the projections of real retirement incomes show flat lines for the 75th and 90th percentiles. Under the 50th percentile, assets are exhausted by 25 years and the income (and remaining wealth) falls to zero. Assets are exhausted by 17 years for the 10th percentile, and by 20 years for the 25th percentile.
- Remaining wealth is zero by 25 years under the 50th percentile, and it approaches zero under the 75th percentile at 30 years.

**Figure C.10 Systematic Withdrawals**
**Annual Withdrawal Amounts Equal to 6% of Assets at Retirement**
**Adjusted Each Year Thereafter for Inflation Using the CPI**

Retirement Income




Remaining Wealth



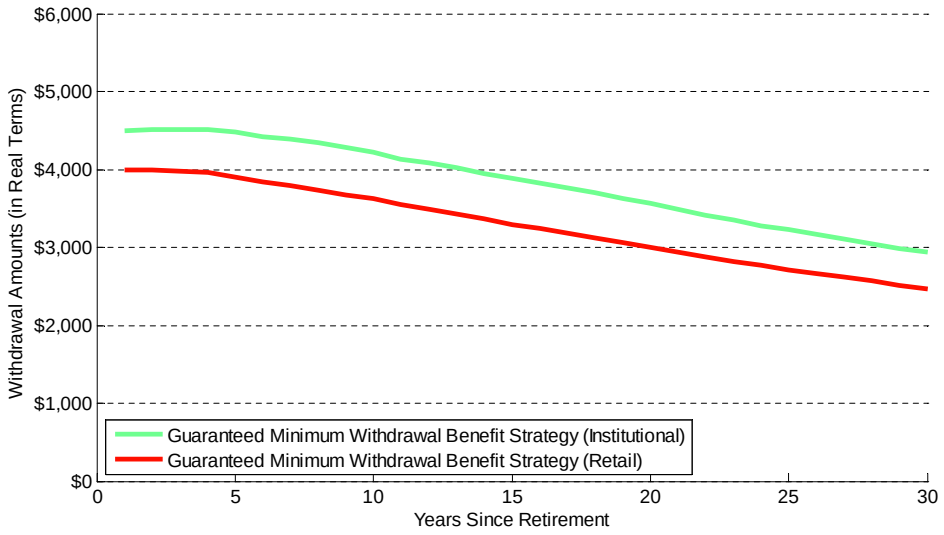

Source: Dr. Wade Pfau.

***Analysis***

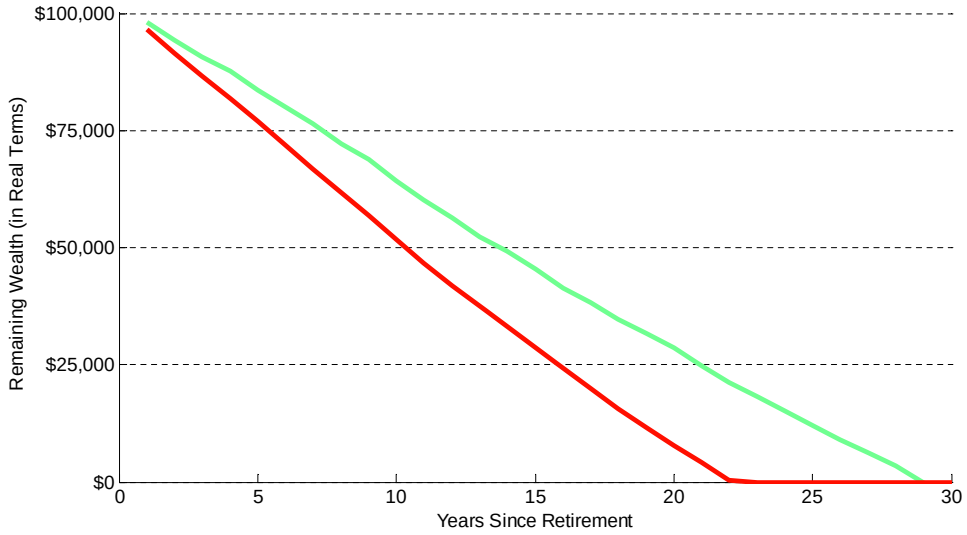
- With this RIG, the amount of annual retirement income is fixed at 6% of beginning assets, adjusted for inflation. The purpose of this graph and Figure C.9 is to illustrate the risk of systematic withdrawal amounts with high withdrawal rates with no adjustment for investment performance.
- The income amounts aren't adjusted for favorable or unfavorable investment results, and they're paid indefinitely or until assets are exhausted. As such, the projections of real retirement incomes show flat lines for only the 90th percentile. Under the 50th percentile, assets are exhausted by 20 years and the income (and remaining wealth) falls to zero. Assets are exhausted by 14 years for the 10th percentile, and by 16 years for the 25th percentile.
- Remaining wealth is zero by 20 years under the 50th percentile, and it only stays above zero for the entire 30 years under the 90th percentile.

**Figure C.11 GMWB Annuities**
**Comparison of Institutional and Retail Products, *Expected* Scenario (50th percentile)**

Retirement Income




Remaining Wealth



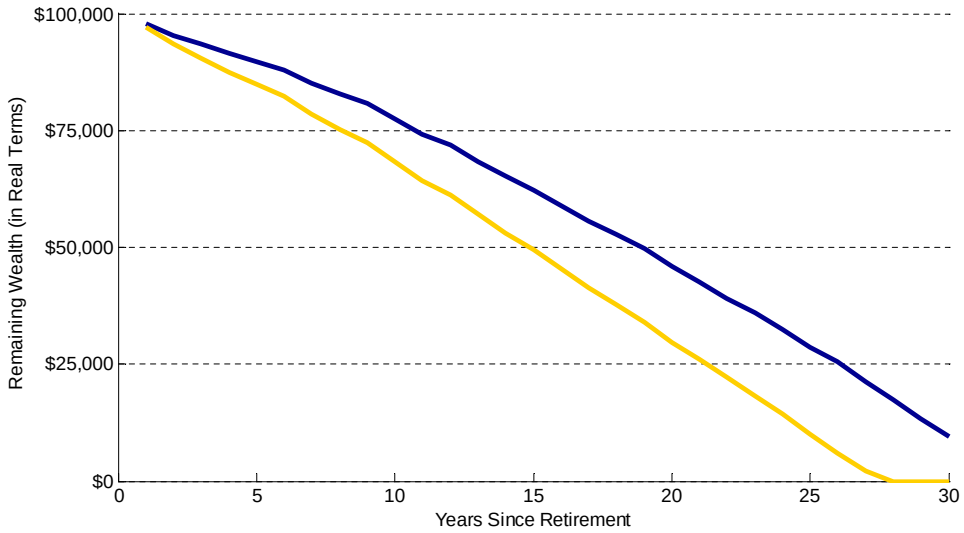

Source: Dr. Wade Pfau.

***Analysis***

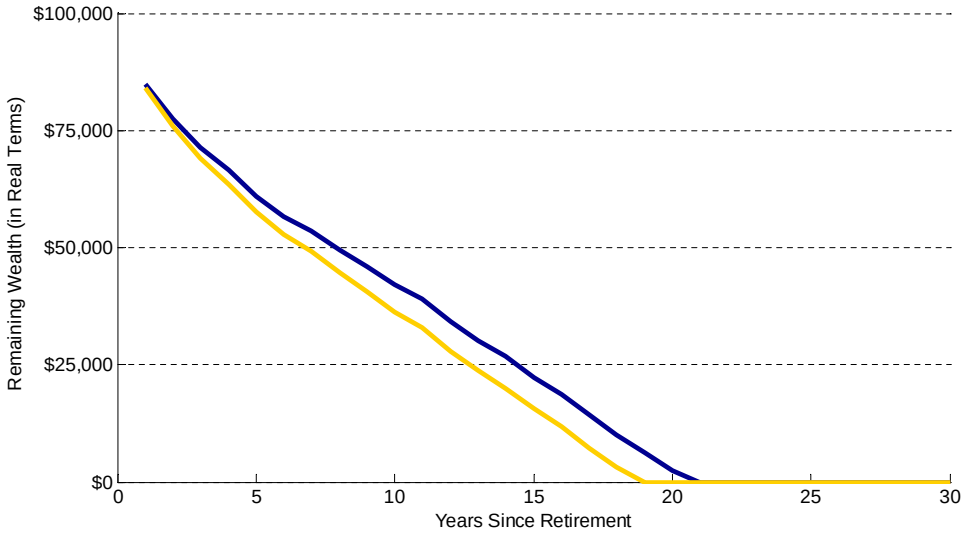
- Initial retirement income is 12-1/2% higher with institutional pricing, widening to a gap of 16% after 10 years and 19% after 20 years.
- Remaining wealth is depleted six years earlier with institutional pricing: by 23 years with retail pricing and by 29 years with institutional pricing.

**Figure C.12 Systematic Withdrawals**
**Annual Withdrawal Amount Equal to 4% of Assets at Retirement**
**Comparison of Institutional and Retail solutions, Remaining Wealth**

Retirement Wealth – *expected* at 50th percentile




Remaining Wealth – *unfavorable* at 10th percentile



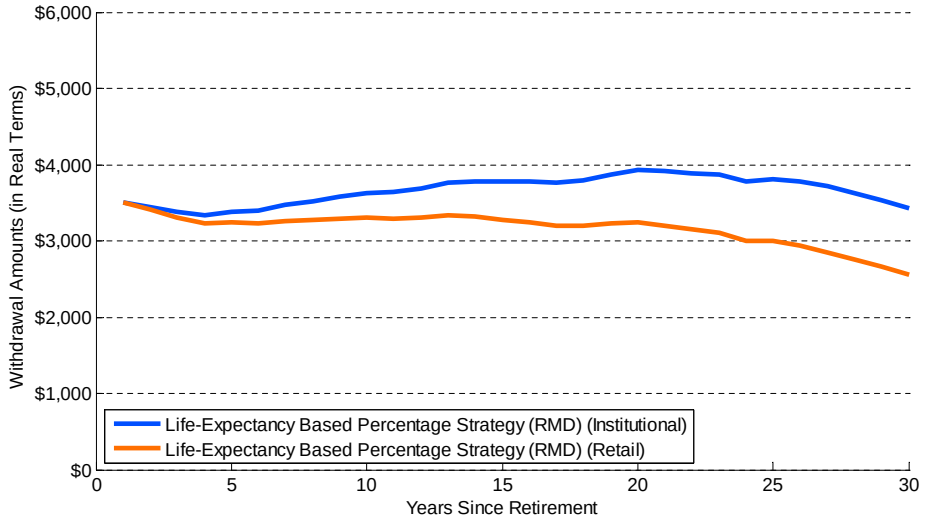

Source: Dr. Wade Pfau.

***Analysis***

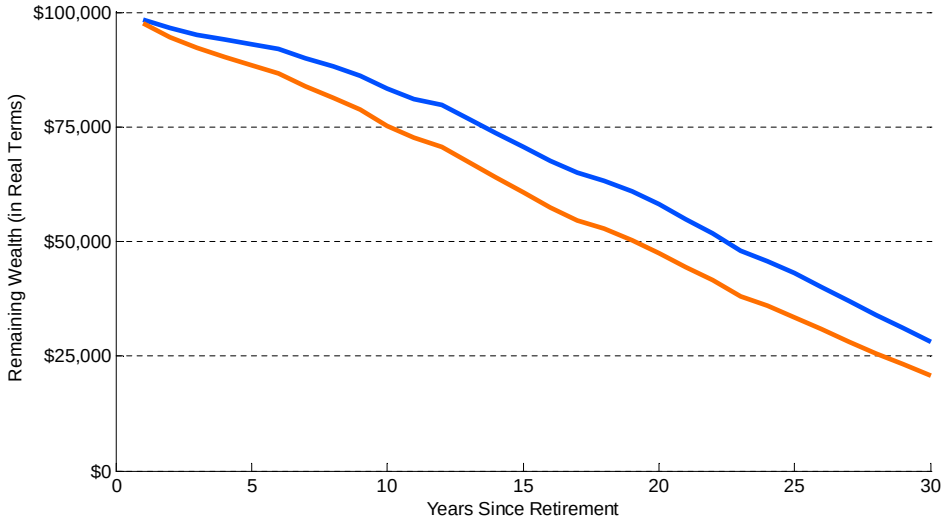
- Because the withdrawal amount is fixed at retirement, income amounts don't change until assets are depleted. Under the expected scenario (50th percentile), retail pricing depletes assets by 28 years, whereas institutional pricing doesn't deplete assets over the 30-year period. Assets are depleted with retail pricing two years earlier under the unfavorable scenario (10th percentile).

**Figure C.13 Systematic Withdrawals–RMD**
**Comparison of Institutional and Retail Solutions**

Retirement Income – expected at 50th percentile




Remaining Wealth – expected at 50th percentile




Source: Dr. Wade Pfau.

***Analysis***

- Retirement income and remaining wealth amounts are 10% higher with institutional pricing after 10 years and 21% higher after 20 years.

***"To the extent that individuals arrive at old age mentally sharp, physically fit, and financially secure, societies will thrive."***

*- Dr. Laura Carstensen, Founding Director,*
*Stanford Center on Longevity*

***"The work of science is to substitute facts for appearances and demonstrations for impressions."***

*- John Ruskin,*
*Motto of Society of Actuaries*

SOCIETY OF ACTUARIES