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## A New Approach to Retirement Income: Next-Gen vs. Traditional VAs

By Wade D. Pfau, Ph.D., CFA<sup>®</sup>

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## Executive Summary

Variable annuities with income guarantee riders have gained great popularity as a retirement income tool. Their appeal to investors is based upon the combination of downside protection, upside potential and a guaranteed income stream in one investment package, while also offering the potential for tax deferred accumulation and maintaining liquidity for remaining assets. With mortality and expense (M&E) charges as well as guarantee rider charges, fees for these products frequently exceed 2% or even 3% per year.

Now a next generation of Investment-Only Variable Annuities (IOVAs) has been re-engineered first and foremost to maximize the power of tax deferral, by featuring lower costs and a broad selection of underlying investment options, including alternative funds that employ strategies like those favored by hedge funds and elite institutional investors.

When contemplating the role of a variable annuity in a retirement plan, this next generation of low-cost Investment-Only VA serves as a tax-advantaged investment account, one that can adapt to a wide range of unique asset management strategies and risk profiles, to generate income and support a systematic withdrawal strategy — without the added cost of income guarantees.

The purpose of this paper is to examine a variety of scenarios to determine when a VA with a guaranteed income rider, such as a Guaranteed Lifetime Withdrawal Benefit (GLWB), is worth the cost of the additional protection it provides, and when a low-cost Investment-Only VA may benefit the client. This paper explores how well an unguaranteed low-cost Investment-Only VA can replicate a rider's guaranteed income payments. It examines a range of different income withdrawal periods, both with and without a tax-deferred accumulation period before the income phase. For clients seeking the tax deferral advantages of a variable annuity, this whitepaper also provides guidance about the relevant client characteristics for choosing from amongst the options.

For certain investors, there can be more efficient ways to obtain upside potential and downside protection than by using a Guaranteed VA. Client preferences and characteristics will motivate whether the low-cost Investment-Only VA structure is more attractive than a variable annuity with an income guarantee. Characteristics favoring this next generation of low-cost Investment-Only VA include the desire to use a tax-deferred accumulation period before taking withdrawals, greater optimism about future market performance, below average expectations about remaining longevity, preferences which lean more toward preserving assets for legacy or other purposes, and investment objectives focusing more on upside potential.

An analysis was completed by running 5,000 Monte Carlo Simulations on a low-cost IOVA and a hypothetical VA/GLWB combining characteristics of more than 30 popular guaranteed variable annuities, using more than 8 decades of market data to simulate how often a rider might be useful, and what the true value of that rider would be.

One fundamental conclusion of our research is this — just as the power of tax-deferred compounding can grow wealth, its corollary is that the drag of compounding fees can reduce wealth.

**Remaining Wealth or Shortfalls for a VA/GLWB and the Low-Cost IOVA  
with a 60/40 Asset Allocation and for Unguaranteed Low-Cost IOVA  
Replicating the VA/GLWB Payouts**

**Based on \$100,000 Investment and Historical Market Averages**

**After 10 years accumulation and 20 years withdrawal:**

Low-Cost IOVA: 40% more assets

VA/GLWB: 70% less assets

**After 20 years accumulation and 20 years withdrawal:**

Low-Cost IOVA: 150% more assets

VA/GLWB: 90% less assets

**After 20 years accumulation and 30 years withdrawal:**

Low-Cost IOVA: 190% more assets

VA/GLWB: Assets depleted

**Other Key Findings include:**

**GUARANTEED VA (VA/GLWB)**

- In all scenarios, the VA/GLWB will provide guaranteed income, even if the account balance falls to zero.
- But at the same time, high asset-based fees are very likely to erode returns on underlying assets.
- There is a risk of depleting all remaining wealth and driving the ending balance to zero.
- For clients with liquidity needs or legacy plans, this means the potential liquidity for the VA/GLWB can be oversold and to some extent is illusory.
- If keeping pace with inflation is a priority, the VA/GLWB is less likely to deliver the desired outcome.

**LOW-COST IOVA**

- In the majority of scenarios, the low-cost Investment-Only VA can replicate the guaranteed payments of the VA/GLWB.
- Lower costs help to maximize the benefits of tax-deferred compounding.
- There is minimal risk of depleting wealth — and a likelihood of creating more accumulated wealth over time.

The retirement income challenge is very real. There is an urgent need for a new approach to generate enough income for a retirement that could last twenty or thirty years — or more. There will be cases where guaranteed income VAs are the right fit for your client. But as their costs go up, while their benefits go down, helping clients understand what they pay for — and what they get — is important. Now a new approach is available, leveraging the power of tax-deferral with low-cost Investment-Only VAs to maximize accumulation, generate more retirement income and leave a larger legacy.

## Introduction

Guaranteed income products have evolved significantly in the U.S. since variable annuities (VAs) were first introduced by the Teachers Insurance and Annuities Association-College Retirement Equity Fund (TIAA-CREF) in 1952.<sup>1</sup> Initially used as a tax-deferred vehicle to fund pension arrangements, the product saw a few decades of slow growth. But in the 1980s, VAs experienced a tipping point.

The Tax Reform Act of 1986 limited the opportunity for tax-deferred saving in qualified retirement plans, making annuities relatively more attractive than other retirement saving vehicles.<sup>2</sup> Insurers began promoting annuities as a tax-advantaged alternative to the recently introduced IRAs. Then, the bull market of the 1990s caused annuity assets to soar as investors wanted to defer taxes on the double-digit returns in their portfolios. Between 1989 and 1993 individual annuity premiums increased from \$58.6 to \$71.8 billion, largely as a result of growth in variable annuity sales.<sup>3</sup>

Subsequently, in the late 1990s, to compete with declining availability of defined benefit pension plans, insurers began to offer variable annuity products with guarantees as a way to boost sales.<sup>4</sup> Thus was born a new era of VAs — one that focused on the product's underlying insurance guarantee, rather than the tax advantages.

Since then, many advisors have relied on variable annuities with income guarantees as a way to insure that their clients have sufficient income to meet their retirement needs. But in the years since the financial crisis, historic low yields and ongoing volatility has made it increasingly challenging for insurers to manage the risk on their balance sheet, making it more costly to provide these guarantees. These shifts have caused a growing number of VA companies to make significant changes to the underlying attributes of the product — in some cases, companies have withdrawn from the VA industry entirely. The industry has seen many providers cut benefits, raise fees, re-tool products and renegotiate guarantees, all rendering the current VA products on the market vastly different from their predecessors of the 1980s.

At the same time, as the advisor industry shifts increasingly towards the fee-based or fee-only model, a new generation of VAs has been designed to meet the unique needs of these RIAs and fee-based advisors in today's market. This new generation of VAs goes back to the roots of the product — harnessing the benefits of tax deferral. Research has shown that a tax-deferred vehicle such as a low-cost, no-load VA has the potential to increase returns by an average of 100 bps or more.<sup>5</sup>

By eliminating commissions and their inherent conflict of interest, while offering lower costs, more underlying funds and the right selection of portfolio management tools, this next-generation of low-cost Investment-Only VAs can provide upside to a comprehensive

<sup>1</sup>The Committee of Annuity Insurers

<sup>2</sup>National Association of Insurance Commissioners & The Center for Insurance Policy and Research

<sup>3</sup>The Committee of Annuity Insurers

<sup>4</sup>Study on the State of the Life Insurance Industry: Implications of Industry Trends

<sup>5</sup>The Tax-Efficient Frontier: Improving the Efficient Frontier with the Power of Tax Deferral, by David Lau, Jefferson National, June 2010.

retirement income strategy. As always, it's important for RIAs, fee-based advisors, and their clients, to understand the differences, and appropriate uses for, the traditional guaranteed variable annuity and the next-generation VA.

### Positioning VAs with Guaranteed Income Riders in a Retirement Plan

For retirement planning, advocates of VAs with guaranteed income riders generally cite several key advantages relative to a systematic withdrawal strategy using taxable assets. These advantages include:

1. Tax deferral
2. Ability to lock-in growth for the benefit base during the accumulation period
3. Guaranteed income for life during the distribution period
4. Liquidity, as the contract may be terminated with remaining assets returned

There are nuances to each of these four factors, as discussed below.

#### Tax Deferral

First, the variable annuity structure can provide the advantage of tax deferral. This is a meaningful benefit of VAs — and one often overshadowed by the industry's escalating focus on income guarantees and other riders. Studies suggest tax deferral can increase performance potential by 100 to 200 bps — without increasing risk.<sup>6</sup> But with asset-based fees that typically range between 2% or 3% per year, or more,<sup>7</sup> most traditional VAs with guaranteed income riders will easily wipe out the 100 to 200 bps benefit of tax deferral. To maximize the value of tax deferral the variable annuity must be low cost.

#### Lock-In Growth for the “Benefit Base”

A second advantage of the Guaranteed VA is the ability to lock in a guaranteed growth rate on the “benefit base” during the accumulation period, including the ability to define the benefit base as the high-water mark of the contract value of the underlying assets over the history of the rider. This benefit base is a hypothetical number used to calculate the amount of guaranteed income paid during the withdrawal phase, and clients do need to understand that it is distinct from the actual contract value of the underlying assets in the annuity.

For example, if the roll-up rate for the benefit base is an annually compounding 6% return, the value of the benefit base would double in approximately 12 years. Conversely, the actual contract value of the underlying assets will be determined by market performance. After the 12-year accumulation period has passed, if the market has underperformed and the value of the benefit base is significantly higher than the contract value of the underlying assets, then the income guarantee is “in the money.” In such a case, the client may wish to continue paying for the rider and to receive the guaranteed income as calculated on this higher benefit base.

<sup>6</sup>The Tax-Efficient Frontier: Improving the Efficient Frontier with the Power of Tax Deferral, by David Lau, Jefferson National, June 2010.

<sup>7</sup>2013 IRI Fact Book, 12th Edition, Insured Retirement Institute, 2013.

On the other hand, if markets performed well during those 12 years, the contract value of the underlying assets may be close to or greater than the value of the benefit base. In this case, the client may decide to let the income guarantee expire, liquidate the VA, and have the contract value of the underlying assets returned to be reinvested in another vehicle.

### Guaranteed Income for Life

The third advantage of the Guaranteed VA is that it pays a guaranteed income for life based on a fixed percentage of the hypothetical benefit base. For many clients, the most compelling aspect of the Guaranteed VA is that even in cases when the contract value of the underlying assets have been depleted to zero, the Guaranteed VA will continue to pay during the lifetime of the annuitant. Once withdrawals begin, a floor for the benefit base is set, and the guaranteed income payments can never decline.

Conversely, once withdrawals begin, the guaranteed roll-up typically will no longer apply. That means the benefit base is unlikely to grow, and guaranteed income payments are unlikely to increase, unless market returns are strong enough for the value of the underlying assets to sustain persistent gains that can exceed ongoing withdrawals and fees. When markets perform well, there is a remote chance that guaranteed income can increase. However, Pfau (2013) illustrates how this potential for continued step-ups becomes increasingly unlikely over time, as withdrawals and fees are more likely to deplete the underlying assets.

With the declining probability for step-ups, income from the Guaranteed VA generally will not keep pace with inflation. As a result, most guaranteed income riders provide only nominal protection, as opposed to inflation-adjusted or “real” protection. Though the monetary value of the benefit base and its subsequent income is guaranteed not to shrink, inflation will erode the purchasing power over time.

In scenarios where the markets do not perform well, and there is no chance for further step-ups, the guaranteed income rider essentially will behave like a fixed single-premium immediate annuity (SPIA). However, it should be noted that in most cases the Guaranteed VA will cost more and payout at a lower rate than competitive SPIAs. The Guaranteed VA's lower payout on the downside reflects the two factors that make it cost more than a SPIA — the value of the rider's upside potential, as well as the ability to liquidate the VA and access the contract value of remaining assets. As a result, when the contract value of the underlying assets is close to the benefit base, clients may find that they are able to guarantee more income by liquidating the Guaranteed VA, and using the remaining assets to purchase a SPIA from another provider.

Milevsky (2009) describes this income guarantee pricing as an example of translating matters into terms which clients do not understand. High guaranteed growth rates during the accumulation period may sound very attractive, but owners must take care to understand that this applies only to the hypothetical benefit base, and may be offset by unattractive annuitization payout rates during the income withdrawal phase. The underlying internal rate of return offered by the Guaranteed VA is the important number to consider, but it becomes obscured by focusing separately on roll-up rates and payout rates. As well, owners are exposed to the credit risk of the insurers, as the guaranteed income rider may not be protected by state guarantee associations.

## Liquidity

The final advantage of the Guaranteed VA is its liquidity. The guarantee can be ended at any time and remaining assets can be returned. This overcomes the least popular feature of SPIAs, which is their complete lack of liquidity. Once a SPIA is purchased, assets are relinquished to the insurance company and will be inaccessible at any point in the future, including the event of an early death, unless the SPIA offers other features for a period-certain payout or a rider to refund any remaining principal at death.

However, it should be noted that this potential liquidity of Guaranteed VAs can be oversold and to some extent is unlikely. Higher asset-based fees are very likely to erode returns on underlying assets, depleting all remaining wealth and driving the ending balance to zero more quickly than with a low-cost Investment-Only VA. Facing faster erosion of the contract value with Guaranteed VAs, clients may encounter greater difficulties in covering unexpected expenses, meeting other liquidity needs or keeping pace with inflation later in retirement.

## Characteristics of a Hypothetical Variable Annuity with a Guarantee Rider

For the purposes of this analysis, the variable annuity with a guaranteed income rider is a hypothetical composite representing the average characteristics across the offerings from five major companies. It is not an exact match to any existing product, and it will be fairly simple to understand. It offers downside protection through lifetime income, upside potential with step-ups based on the underlying portfolio performance and a guaranteed roll-up rate, and no surrender penalties.

Table 1 summarizes the key features. On average across these five companies, the maximum allowed stock (or risky asset) allocation was 79%, and this amount varied from 40% to 100% across the product offerings. This is a bimodal distribution, however, as one company offers a number of different products allowing a 100% risky asset allocation, while most of the other companies have lower caps on risky assets. To reflect this and to understand the potential differences, we will consider simulations with both a 60% stock allocation and a 100% stock allocation.

During the accumulation phase, the benefit base grows by at least 5.3% on an annually compounded basis. Across the product offerings, the guaranteed minimum growth rates for the accumulation period ranged from 1% to 7%. The average M&E applied to the underlying contract value of assets was 1.29%. Meanwhile, the average rider fee applied to the benefit base was 1.35%. It is important to note that in cases when the contract value of underlying assets is less than the benefit base, the fees applied to the benefit base will have a larger impact as a percentage of the remaining contract value and will erode more quickly the underlying assets. Both types of fees are charged only when the contract value is above \$0.

Our analysis considers a client beginning income withdrawals at age 65, and the average guaranteed payout rate is 4.8% at this age. Among the companies, guaranteed payout rates starting at 65 ranged from 3.75% to 6.5%. Guaranteed income withdrawals in all

subsequent years will be 4.8% of the benefit base; income will increase if the benefit base can reach new high-water marks. Step-ups in guaranteed income will occur on the anniversary of the policy, if the contract value of the remaining underlying assets exceeds the past high-water mark. The average additional annual account fee for these variable annuities was \$39.

Meanwhile, the Investment-Only VA is a low-cost product with no asset-based insurance fees. An annual charge of \$240 (or, \$20 per month) is taken from the account regardless of the amount of underlying assets invested or how much the contract value grows. Assuming that this unguaranteed low-cost Investment-Only VA is designed expressly for RIAs and fee-based advisors who will charge a fee for fiduciary oversight of the portfolio, an additional annual advisory fee of 1% is included for the purposes of this analysis. Underlying fund expenses however, are not included.

**Table 1:**  
**Features of Variable Annuity with Guarantee Across Five Major Companies**

	Average	Minimum	Maximum
Allocation to Stocks (Risky Assets)	79%	40%	100%
Guaranteed Roll-Up Rate in Deferral Period	5.3%	1.0%	7.0%
Mortality and Expense Fee on Account Value	1.29%	0.00%	1.90%
Rider Fee on VA High-Watermark Benefit Base	1.35%	1.00%	2.70%
Guaranteed Income Withdrawal Rate for 65 Year Old	4.80%	3.75%	6.50%
Annual VA Fee (Regardless of Account Size)	\$39	\$35	\$50
Frequency of Checks for New High Watermark	Annual		

**Features of Low-Cost Investment-Only Variable Annuity**

Annual VA Fee (Regardless of Account Size)	\$240
Annual Advisory Fee for Account Value	1.00%

**Data and Modeling Approach**

One of the most important matters for determining the value of a Guaranteed VA is to consider whether a portfolio of comparable underlying funds in the unguaranteed low-cost Investment-Only VA would be able to replicate the guaranteed income payments, without depleting wealth. If remaining wealth does not fall to zero, then the low-cost Investment-Only VA could support the guaranteed income payments.

In a comprehensive analysis, Guaranteed VAs were compared with low-cost Investment-Only VAs for the pre- and post-retirement periods using 5,000 Monte Carlo simulations, based on more than 8 decades of market data, to simulate how often a rider might be useful, and what the true value of that rider would be. The material difference between the two types of VAs is their fee structures and the presence of a guarantee.

In all cases, the client invests \$100,000 into the variable annuity. Analysis is provided for two sets of assumptions about future capital market expectations. Income withdrawal is assumed to begin at age 65, and the assumed horizon for income withdrawals is either 20 or 30 years. The analysis also includes a range of accumulation periods of zero, five, ten, or twenty years. When there is an accumulation stage, we assume that the variable annuity is purchased a sufficient number of years prior to age 65. For instance, with a 10-year accumulation period, the client purchases the variable annuity at age 55, experiences 10 years of accumulation, and begins income at age 65.

With the Guaranteed VA, the purpose of the accumulation period is to lock in the high-water mark for the benefit base. This value is the higher of the actual contract value of underlying assets at past anniversary dates or the hypothetical value of the benefit base assuming a 5.3% annually compounded return on underlying assets. With the Investment-Only VA, low-cost tax-deferred compounding is the primary advantage during the accumulation phase, and typically adds value during the withdrawal phase as well.

Once income withdrawal begins, there is no longer a guaranteed roll-up rate for the benefit base of the Guaranteed VA. But if market performance is sufficiently strong and assets are able to grow to a new high-water mark value after subtracting withdrawals and fees, then guaranteed income will increase to reflect a fixed payout percentage of the new benefit base.

In all cases, returns are calculated on an annual basis with withdrawals taken at the beginning of each year, fees are taken at the end of each year and annual rebalancing is performed. Results are expressed in inflation-adjusted terms with the base year defined as the purchase date. As income guarantees are provided only in nominal terms while results are presented in real terms, it is important to understand that the benefit base and guaranteed income amounts can both decline in real terms as inflation erodes the value of the nominal guarantees.

Table 2 provides the asset market assumptions on which the simulations are based (using a multivariate lognormal distribution). The table shows the historical averages which guide many other analyses of retirement income, and it also shows a more pessimistic set of assumptions which are guided by current market conditions reflected in today's lower bond yields.

For the historical averages, Ibbotson Associates' *Stocks, Bonds, Bills, and Inflation* (SBBII) provides data on total returns for U.S. financial markets since 1926, with the U.S. S&P 500 index representing the stock market and the intermediate-term U.S. government bond index representing the bond market.

For current market conditions, the standard deviations and correlation coefficients are based on the same historical data. The arithmetic mean for bond returns is calibrated to lower recent TIPS yields. The arithmetic mean for inflation is calibrated to the breakeven inflation rate implied by TIPS and Treasury yields. The arithmetic mean for stock returns

is calibrated to allow an equity premium of 4.8% above the bond return. This is the equity premium for a GDP-weighted portfolio of 19 developed market countries between 1900 and 2010 in the Dimson, Marsh, and Staunton Global Returns Dataset provided by Morningstar and Ibbotson Associates. This equity premium assumes the U.S. market will behave more in line with international averages, as the corresponding equity premium in the U.S. historical data shown in the table is 6%.

**Table 2:**  
**Capital Market Expectations**

**ASSET MARKET ASSUMPTIONS BASED ON CURRENT MARKET CONDITIONS**

	Arithmetic Means	Geometric Means	Standard Deviations	Stocks	Correlation Coefficients Bonds	Inflation
Stocks	4.8%	2.8%	20.0%	1	0.1	-0.2
Bonds	0.0%	-0.2%	7.0%	0.1	1	-0.6
Inflation	2.5%	2.4%	4.2%	-0.2	-0.6	1

**SUMMARY STATISTICS FOR U.S. REAL RETURNS AND INFLATION DATA, 1926 - 2011**

	Arithmetic Means	Geometric Means	Standard Deviations	Stocks	Correlation Coefficients Bonds	Inflation
Stocks	8.6%	6.5%	20.3%	1	0.1	-0.2
Bonds	2.6%	2.3%	6.8%	0.1	1	-0.6
Inflation	3.1%	3.0%	4.2%	-0.2	-0.6	1

### The Relationship Between VA Outcomes and Capital Market Expectations

The relationship between the VA outcomes and capital market expectations is complicated. When investment performance is strong and inflation is low, the guaranteed approach will deliver greater upside potential with step-ups for the benefit base, relative to a less aggressive but unguaranteed approach. But at the same time, there is an increased likelihood that the low-cost Investment-Only VA also will be able to sustain withdrawals equal to the Guaranteed VA. In other words, there will be less downside risk and therefore less need for the guarantee. In hindsight, clients would have been better off by avoiding the higher fees of the Guaranteed VA, and more likely to benefit from maximizing the power of tax deferral with the lower fees of the Investment-Only VA.

The more relevant case is when market returns are poor. There will be fewer step ups and less upside, but a Guaranteed VA will continue to provide income, even as the combination of high fees and low returns will accelerate the likelihood that the underlying assets will be depleted and will drive the ending balance to zero. Likewise, the unguaranteed low-cost Investment-Only VA faces greater downside risk and poor market returns clearly can increase the odds for asset depletion. But there will be some relief, and the Investment-Only VA will be more likely to preserve assets and generate steady income, due to lower fees.

Likewise, in poor markets, the issue of liquidity for the Guaranteed VA becomes increasingly relevant. As higher asset-based fees are very likely to erode returns on underlying assets, there is a substantial risk of depleting all remaining wealth and driving the ending balance to zero, meaning access to underlying assets may prove illusory. Furthermore, the Guaranteed VA's lack of inflation protection could result in insufficient income to cover essentials, meet liquidity needs or fund retirees' other expenses.

### Results: Remaining Wealth or Shortfalls

This analysis was developed to examine the withdrawal amounts generated by a guaranteed portfolio and whether these amounts could be replicated by an unguaranteed portfolio. Ultimately, we have found that the low-cost Investment-Only VA is likely to be able to keep pace and replicate the results of the Guaranteed VA in a diverse range of scenarios and market conditions. Likewise, we have found that in many cases that there is a greater likelihood that the low-cost Investment-Only VA will generate a larger ending balance than the Guaranteed VA. Our research clearly demonstrates that just as the power of tax-deferred compounding can grow wealth, its corollary is that the drag of compounding fees can reduce wealth.

The Guaranteed variable annuity and the low-cost Investment-Only VA structures were compared for four different accumulation periods (0, 5, 10 and 20 years) followed by two different income distribution periods (20 or 30 years) for two sets of capital market assumptions. First, Tables 3 and 4 are based on the more commonly used historical market averages, which represent optimistic returns for bonds and stocks relative to the current low interest rate environment. Table 3 provides the analysis using a 60/40 asset allocation between risky assets (large-cap stocks) and intermediate-term government bonds. Table 4 repeats this analysis assuming an underlying asset allocation of 100% risky assets.

### Remaining Wealth or Shortfalls: Historical Market with 60/40 Asset Allocation

Consider the first row of Table 3, which compares the VA/GLWB guaranteed approach with the low-cost Investment-Only VA's unguaranteed approach, assuming income begins immediately and the distribution period lasts for 30 years with a 60/40 asset allocation and centered on historical market averages. The difference is very clear. There is a 40% chance that the contract value of the VA/GLWB will be depleted after 30 years, relative to only 7.8% probability of depletion for the low-cost Investment-Only VA. As the simulations compare the same asset returns for the same asset allocation and distribution amounts, this significant difference in depletion probabilities reflects the impact of higher underlying fees when using the guaranteed approach.

**Table 3:**
**Remaining Wealth or Shortfalls for a VA/GLWB and the Low-Cost IOVA  
with a 60/40 Asset Allocation and for Unguaranteed Low-Cost IOVA  
Replicating the VA/GLWB Payouts**
**Based on \$100,000 Investment and Historical Market Averages**

Length (in Years)			Probability of	Median Real	Median Real	Median	Median	Median Excess
Accumulation	Distribution		Wealth	Income	Shortfall for IOVA	Remaining Real	Cumulative Real	Remaining Real
Period	Period		Depletion	Supported by	Relative to	Wealth at End	Fees for	Wealth for
				VA/GLWB	VA/GLWB in		VA/GLWB	IOVA
					Depletion Cases			
0	30	VA/GLWB	40.0%	\$4,078		\$10,606	\$55,710	
		IOVA	7.8%		\$12,091	\$81,460		\$70,855
5	30	VA/GLWB	51.7%	\$4,801		\$0	\$74,924	
		IOVA	11.3%		\$17,781	\$112,266		\$112,266
10	30	VA/GLWB	58.0%	\$5,603		\$0	\$98,589	
		IOVA	12.1%		\$28,299	\$159,709		\$159,709
20	30	VA/GLWB	66.7%	\$7,603		\$0	\$152,986	
		IOVA	11.4%		\$45,656	\$295,331		\$295,331
0	20	VA/GLWB	9.4%	\$4,453		\$42,804	\$43,704	
		IOVA	1.2%		\$6,021	\$82,889		\$40,084
5	20	VA/GLWB	22.3%	\$5,288		\$37,384	\$63,838	
		IOVA	3.1%		\$8,774	\$106,562		\$69,178
10	20	VA/GLWB	32.9%	\$6,196		\$29,718	\$86,753	
		IOVA	4.2%		\$13,445	\$139,893		\$110,175
20	20	VA/GLWB	46.0%	\$8,612		\$10,988	\$145,581	
		IOVA	5.9%		\$29,170	\$250,376		\$239,389

With \$100,000 of assets and a 4.8% withdrawal rate from the underlying benefit base, the median inflation-adjusted income supported by the VA/GLWB over 30 years is \$4,078. In this median case, average income over 30 years falls by 15%, reflecting the VA/GLWB's inability to provide inflation protection. Nonetheless, the guaranteed approach does continue to provide income even in the event of asset depletion. On the other hand, while the low-cost Investment-Only VA's unguaranteed approach is likely to match the VA/GLWB more than 90% of the time, it cannot match income for 7.8% of cases. In this scenario, the median shortfall is \$12,091, which represents approximately 2-3 years of missed spending over the 30 year period.

While the guaranteed approach of the VA/GLWB will continue to provide limited income for longer than the unguaranteed approach of the low-cost IOVA in 7.8% of the simulations, the costs of this guarantee in terms of reduced wealth accumulations is substantial even in the median outcome. Realizing that in bad market outcomes guaranteed income from the VA/GLWB will fall short of its initial level in inflation-adjusted terms, the client must think hard about whether the cost of the guarantee is worthwhile. It is important to reflect on the cost of this income protection in the worst-case scenarios, as we've already observed how the guaranteed approach will consume remaining assets more quickly and reduce liquidity more rapidly than the unguaranteed approach.

The power of tax-deferred compounding to grow wealth does have a corollary in the drag of compound fees to reduce wealth, as can be seen moving across this row. The next column indicates the median amount of remaining wealth after 30 years. It is \$10,606 for the guaranteed approach and \$81,460 in the unguaranteed approach — 8 times more wealth with the IOVA. The next column shows the median cumulative real fees paid for the guaranteed approach over 30 years, which add up to \$55,710. But the final column, which is the difference in remaining wealth after 30 years reflects the true underlying impact of fees in the median case. The unguaranteed approach of the low-cost IOVA would provide clients with a real difference in wealth of \$70,855, retaining 70.9% of the initial value invested in the variable annuity. This amount is substantially larger than with the VA/GLWB, reflecting the power of low-cost tax-deferred compounding.

Continuing down the rows of Table 3, shows how increasing the length of the accumulation period also increases the probability of wealth depletion with the VA/GLWB. The probability of wealth depletion for a VA/GLWB increases to 58.0% with a 10-year deferral period and the chance of depletion rises to 66.7% with a 20-year deferral period. This reflects the drag caused by the additional decades of compounding fees. Meanwhile, the probability of wealth depletion for the unguaranteed approach experiences only slight increases as the accumulation period lengthens from 10 years to 20 years, with failure rates of 12.1% and 11.4% respectively.

While a longer accumulation period increases the risk of wealth depletion in the VA/GLWB at the same time it also can lead to an increase in guaranteed income, as the benefit base is guaranteed to grow at a minimum rate of 5.3% per year until income withdrawal begins. With 20-years of minimum growth at 5.3%, the initial guaranteed income will grow by at least 281% in nominal terms (before inflation adjustments), such that an initial investment of \$100,000 would support an income guarantee of at least \$13,484. In real terms, this will be less. Table 3 shows that the average real income supported over 30 years after a 20-year accumulation period is \$7,603.

Meanwhile, because a longer accumulation period will increase the benefit base and support greater guaranteed income with a VA/GLWB this in turn will increase the median shortfall of the unguaranteed Investment-Only VA in the small percentage of cases where it fails. Table 3 shows that the median real shortfall after a 20 year accumulation period and a 30 year income period could be more than \$45,000 for the low-cost Investment-Only VA.

Nonetheless, the cumulative cost of these guarantees has a profound impact after 20 years of accumulation and 30 years of income. The next column indicates the median amount of the remaining contract value when using these two different VAs to support the exact same income stream. As shown, the VA/GLWB ends with a remaining balance of \$0, compared to a low-cost Investment-Only VA which ends with a remaining balance of \$295,331. Finally, the median cumulative fees of \$152,986 paid for the VA/GLWB shows the true impact of higher costs, while the the remaining wealth of \$295,331 generated by the Investment-Only VA shows the benefit of low-cost tax deferral.

Looking at the shorter retirement periods in Table 3, results are improved when income distributions do not need to be supported for as long. As the accumulation period declines from 20 to 0 years, the probability of wealth depletion in the VA/GLWB drops from 46% to 9.4%, while the probability of wealth depletion in low-cost Investment-Only VA drops from 5.9% to 1.2%. With the shorter distribution period, the median real income supported by the guarantee is higher as there are fewer years for inflation to reduce the real amount of guaranteed income. Likewise, shortfalls for the unguaranteed approach are also less.

We can again compare the impact of fees for the Guaranteed VA, both directly and indirectly in terms of the differences in wealth accumulations between the two approaches. For instance, with 20 years of accumulation followed by 20 years of income, the guaranteed approach of the VA/GLWB supports a median real amount of remaining wealth of only \$10,988, compared to a median real wealth of \$250,376 for the unguaranteed approach of the low-cost IOVA. While the median cumulative fees paid for the VA/GLWB total \$145,581, illustrating the true impact of higher fees, the remaining wealth of \$239,389 for the Investment-Only VA again helps to illustrate the benefits of low-cost tax deferral.

### **Remaining Wealth or Shortfalls: Historical Market with 100% Risky Assets**

Table 4 repeats this same analysis assuming an underlying asset allocation of 100% risky assets. As compared to Table 3, the more aggressive asset allocation creates greater upside potential as well as greater downside risk, which leads all amounts in Table 4, both the gains and the losses, to be larger. For a 30 year distribution period, where the accumulation period ranges from 0 years to 20 years, wealth depletion probabilities range from 48.8% and 69.7% for the guaranteed approach, while they range from 18.3% to 23.4% for the unguaranteed approach.

**Table 4:**

**Remaining Wealth or Shortfalls for a VA/GLWB and the Low-Cost with a 100/0 Asset Allocation and for Unguaranteed Low-Cost IOVA Replicating the VA/GLWB Payouts  
Based on \$100,000 Investment and Historical Market Averages**

Length (in Years)		Probability of Wealth Depletion	Median Real Income Supported by VA/GLWB	Median Real Shortfall for IOVA Relative to VA/GLWB in Depletion Cases	Median Remaining Real Wealth at End	Median Cumulative Real Fees for VA/GLWB	Median Excess Remaining Real Wealth for IOVA
Accumulation Period	Distribution Period						
0	30	VA/GLWB	48.8%	\$4,975	\$2,393	\$63,781	
		IOVA	18.3%		\$22,132	\$101,539	\$99,147
5	30	VA/GLWB	56.6%	\$6,323	\$0	\$90,152	
		IOVA	22.0%		\$35,471	\$157,859	\$157,859
10	30	VA/GLWB	63.1%	\$7,556	\$0	\$117,869	
		IOVA	23.4%		\$53,103	\$225,160	\$225,160
20	30	VA/GLWB	69.7%	\$11,438	\$0	\$202,431	
		IOVA	21.3%		\$85,643	\$496,972	\$496,972
0	20	VA/GLWB	22.4%	\$5,163	\$42,701	\$48,952	
		IOVA	7.7%		\$10,012	\$95,917	\$53,216
5	20	VA/GLWB	35.0%	\$6,670	\$33,815	\$74,453	
		IOVA	11.6%		\$19,612	\$131,732	\$97,917
10	20	VA/GLWB	43.8%	\$8,368	\$17,928	\$104,217	
		IOVA	14.5%		\$30,403	\$183,228	\$165,300
20	20	VA/GLWB	53.5%	\$12,512	\$0	\$183,868	
		IOVA	14.4%		\$51,164	\$365,981	\$365,981

While this downside risk is greater, upside potential is also greater. For instance, with no accumulation period, the median income supported by the guaranteed approach actually will protect against inflation, rising from an initial \$4,800 to \$4,975. Remaining wealth at the end of the distribution period also is greater. For instance, after no accumulation period and 30 years generating income, the unguaranteed approach using 100% equities provides median real wealth of \$101,539, while the unguaranteed approach using 60/40 allocation provides median real wealth of only \$81,460.

As for fees charged by the VA/GLWB, care must be taken with the interpretations, as fees will be higher when account balances and the benefit base are higher. In other words, a successful investing strategy will generate more income, but will also generate more fees. The greater upside potential does result in greater fees paid for the guarantee in the median case.

## Results: Probability of Wealth Depletion

Regarding the probability of wealth depletion, Figures 1 and 2 visualize the differences between the VA/GLWB and a low-cost Investment-Only VA replicating the same payouts as the guaranteed portfolio. As discussed previously, those attracted to the liquidity value of the VA/GLWB must realize that its higher fees will more quickly erode the value of any remaining assets. For clients with income needs, the liquidity value of the VA/GLWB is, to some extent, illusory in nature. These higher fees, and the subsequent erosion of assets, are the tradeoff clients must make in exchange for the advantage of receiving guaranteed income for life, even when the contract value of assets fall to zero.

Figure 1 shows the probability of wealth depletion by year, when using a 60/40 asset allocation and no accumulation period. As indicated, these probabilities are consistently higher with the guarantee, illustrating the danger of relying on the VA/GLWB to meet future liquidity needs in retirement.

**Figure 1:**  
**The Role of Income Guarantees Over a 0-Year Accumulation Period and 30-Year Retirement Period**  
**Probability of Wealth Depletion by Year in Retirement**  
**Based on Historical Averages**

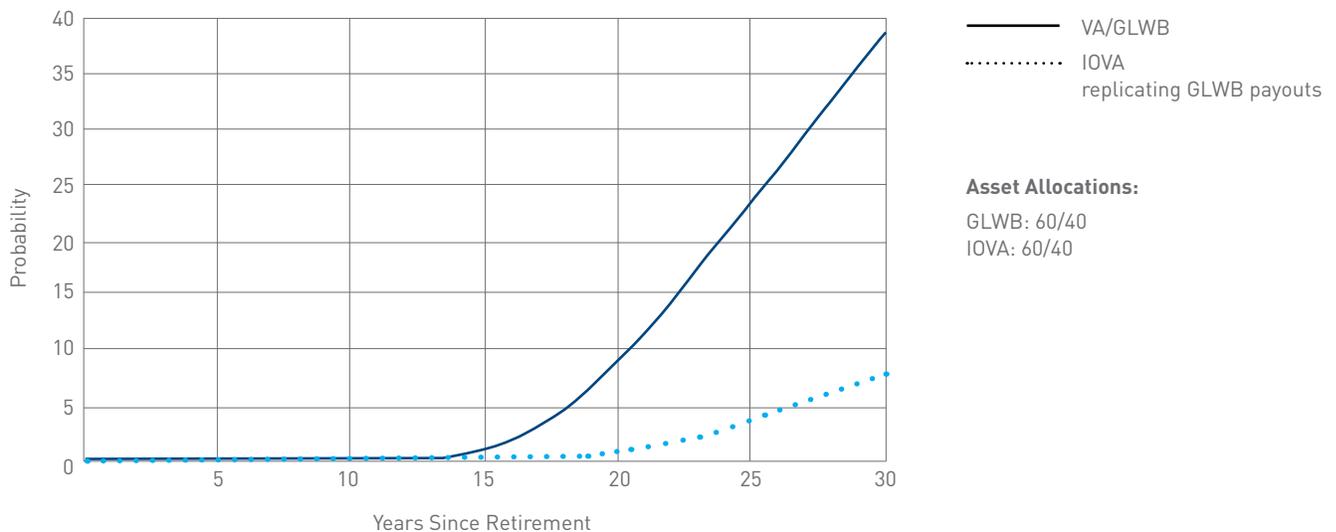
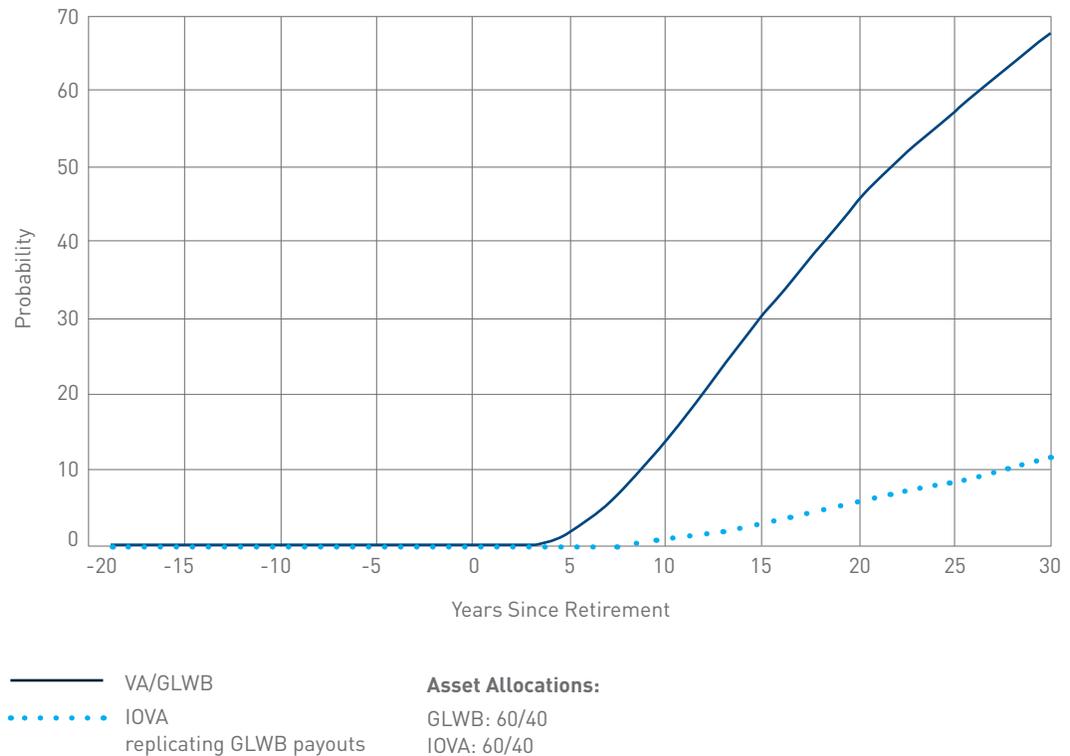


Figure 2 provides the same results when using a 60/40 asset allocation with a 20-year accumulation period prior to the distribution period. In this case, there are scenarios in which the contract value of the VA/GLWB is depleted after just a few years of distribution. It may be a rather surprising result, but again, it is the outcome of paying higher fees. Especially as the guaranteed income rider is taken from the benefit base, it will grow as a percentage of remaining assets and can set the contract value on a trajectory toward zero.

**Figure 2:**  
**The Role of Income Guarantees Over a 20-Year Accumulation Period and 30-Year Retirement Period**  
**Probability of Wealth Depletion by Year in Retirement**  
**Based on Historical Averages**



**Remaining Wealth or Shortfalls: Current Market with 60/40 Asset Allocation**

Finally, Table 5 repeats the analysis of remaining wealth and shortfalls for a 60/40 asset allocation, this time using lower capital market expectations related to the current low interest rate environment. Under these assumptions, the chances of asset depletion for both types of VAs increase dramatically. This makes the guarantee much more valuable, with two important caveats.

First, with lower market performances, it is not clear whether the provider of the VA/GLWB will be able to sufficiently hedge the market risk to support the ongoing payment of guaranteed income for life in the increasingly likely event of portfolio depletion. In this challenging market environment, the contract value experiences at least a 90% probability of depletion over 30 years. This means the annuity provider would be on the hook to pay guaranteed income for life, while funding it from dwindling total fees as portfolio values decline.

Second, those worried about future market returns must also be concerned that the VA/GLWB guarantees will not provide sufficient income in real terms, as the guarantees are only nominal. Even in the median outcome, real spending supported by the VA/GLWB will

fall by 22% over 30 years from \$4,800 to \$3,765. Facing low returns, decreasing income potential and an increased likelihood of asset depletion, the guarantee becomes increasingly valuable. But as previously stated, with the high probability of asset depletion leaving the insurance company on the hook, advisors and clients may worry that this guarantee is too good to be true. Conversely, while the unguaranteed approach will expose clients to a risk of asset depletion, the lower fees of this approach will help to preserve assets for longer than the VA/GLWB.

**Table 5:**  
**Remaining Wealth or Shortfalls for a VA/GLWB and the Low-Cost IOVA with a 60/40 Asset Allocation and for Unguaranteed Low-Cost IOVA Replicating the VA/GLWB Payouts**  
**Based on \$100,000 Investment and Current Market Conditions**

Length (in Years)								
Accumulation Period	Distribution Period		Probability of Wealth Depletion	Median Real Income Supported by VA/GLWB	Median Real Shortfall for IOVA Relative to VA/GLWB in Depletion Cases	Median Remaining Real Wealth at End	Median Cumulative Real Fees for VA/GLWB	Median Excess Remaining Real Wealth for IOVA
0	30	VA/GLWB	90.0%	\$3,765		\$0	\$35,241	
		IOVA	55.8%		\$20,162	\$0		\$0
5	30	VA/GLWB	95.0%	\$4,394		\$0	\$45,698	
		IOVA	65.9%		\$33,718	\$0		\$0
10	30	VA/GLWB	97.6%	\$5,065		\$0	\$55,727	
		IOVA	73.2%		\$50,715	\$0		\$0
20	30	VA/GLWB	99.2%	\$6,739		\$0	\$83,051	
		IOVA	79.4%		\$88,443	\$0		\$0
0	20	VA/GLWB	50.2%	4,162		\$0	\$34,043	
		IOVA	16.3%		\$7,259	\$24,261		\$24,261
5	20	VA/GLWB	75.2%	\$4,834		\$0	\$44,604	
		IOVA	35.7%		\$15,577	\$13,892		\$13,892
10	20	VA/GLWB	86.7%	\$5,661		\$0	\$56,786	
		IOVA	48.4%		\$25,079	\$1,865		\$1,865
20	20	VA/GLWB	95.3%	\$7,515		\$0	\$83,727	
		IOVA	61.6%		\$50,152	0		\$0

## Conclusion

Clients seeking retirement income through a variable annuity can choose from two dramatically different approaches. The traditional VA/GLWB provides guaranteed income for life, but it comes at a high cost that can erode portfolio performance, decimate the value of remaining assets and wipe out the value of tax deferral. The new approach to retirement income includes a next generation of low-cost Investment-Only VA designed to maximize the power of tax deferral, help clients accumulate more, generate more retirement income and leave a larger legacy. But like any systematic withdrawal strategy, it can expose clients to the risk of asset depletion during the distribution phase.

This analysis was developed to provide guidance to advisors about when it may be appropriate to choose one product or the other. There are differences and appropriate uses for both traditional VAs with guarantees and next-generation Investment-Only VAs. It is not possible to make any overall conclusions for or against the guaranteed income riders or the unguaranteed approach, as this is based on client needs and risk profile, and depends on the personal preferences of individuals about market upside and downside and the nature of their liquidity needs. Nonetheless, Table 6 summarizes the characteristics which may lead advisors to recommend one type of variable annuity over the other.

**Table 6:**  
**Uses for Low-Cost Investment-Only VAs and VA/GLWB**

<b>Use Low-Cost IOVA VA When...</b>	<b>Use VA/GLWB When...</b>
Optimistic about future market performance	Pessimistic about future market performance
Spending goals aim to keep pace with inflation	Real spending goals will decline with age
Plan to use a deferral period before drawing income	Plan to begin income withdrawals from VA immediately
Expected remaining longevity is below average	Expected remaining longevity is above average
Investment objectives focused on asset preservation and growth	Investment objectives focused on generating income

Though guaranteed income riders aim to provide upside potential, downside protection, and liquidity in one investment package, the results of this analysis suggest limitations for each of these objectives.

For those optimistic about future market performance, the compounding impact of higher fees will limit the upside growth for the VA/GLWB, whereas clients leveraging the low-cost tax deferral of the Investment-Only VA could expect much larger wealth accumulations in the median case. In addition, the VA/GLWB cannot be expected to provide income which keeps pace with inflation. As the high fees of the VA/GLWB more quickly erode the contract value of underlying assets, those seeking inflation protection for their spending will not find a solution with the guaranteed approach.

For those more pessimistic about the market, the distinct advantage of the VA/GLWB is that it will continue to provide guaranteed income, even when the account balance is depleted to zero. But there will be little likelihood of step-ups to the income base, less upside potential and guaranteed income will fall short in inflation-adjusted terms. Likewise, under challenging market conditions, Investment-Only VAs also face greater downside risk and the likelihood for asset depletion will increase. However income generated by the Investment-Only VA is likely to keep pace with the guaranteed approach, and the IOVA is more likely to preserve underlying assets due to lower fees. This means advisors and their clients must think hard about whether the cost of the guarantee is worthwhile.

As for implementing an accumulation period prior to making withdrawals, the low-cost IOVA is impacted less on the downside than the VA/GLWB. Although somewhat counterintuitive, since the guaranteed approach offers a generous roll-up rate for the benefit base during the accumulation period, the additional years of compounding fees ravage the contract value of the VA/GLWB while Investment-Only VAs offer more growth opportunity by leveraging the power of low-cost tax deferral.

For longer accumulation periods the low-cost Investment-Only VA offers greater relative upside potential compared to the increase in downside risk and will likely be more attractive to clients who seek to accumulate more assets prior to taking income. Likewise, as the guarantee is more likely to become binding over longer distribution periods, those with lower expected longevity will tend to prefer the low-cost Investment-Only VA, which can be seen by comparing the results for the 20-year and 30-year income periods. Finally, those clients focused more on asset preservation and growth will appreciate the enhanced accumulation potential offered by the low-cost Investment-Only VA.

Pfau (2013) suggests that there can be more efficient ways for retirees to obtain upside potential and downside protection than by using a VA/GLWB. That previous analysis considers different combinations of assets and finds that combining stocks with single-premium immediate annuities can potentially do a better job of meeting a particular spending goal in retirement while also preserving financial assets for other unplanned expenses or for a bequest. What this suggests is that clients with sufficient concern about generating income on the downside could use part of their assets to purchase a single-premium immediate annuity, and then the remainder of assets could be used with the low-cost Investment-Only VA to accumulate more, generate more retirement income and leave a larger legacy.

#### **ABOUT WADE D. PFAU, PH.D., CFA**

Wade D. Pfau, Ph.D., CFA, is a Professor of Retirement Income in the new Ph.D. program for Financial and Retirement Planning at The American College in Bryn Mawr, PA. He is a past selectee for the InvestmentNews Power 20 for people expected to shape the financial advisory industry, and is a recipient of Financial Planning magazine's Influencer Awards. His research article on "safe savings rates" won the inaugural Journal of Financial Planning Montgomery-Warschauer Editor's Award, and his work on evaluating the outcomes of different retirement income strategies received an Academic Thought Leadership Award from the Retirement Income Industry Association. He has also served as a past curriculum director for that organization's Retirement Management Analyst (RMA) designation program, and he has contributed to the curriculum of The American College's Retirement Income Certified Professional (RICP) designation. He holds a doctorate in economics from Princeton University, and he has published research on retirement planning in a wide variety of academic and practitioner research journals. He is also an active blogger on retirement research, maintains the educational Retirement Researcher website, and is a monthly columnist for Advisor Perspectives, a RetireMentor for MarketWatch, and an Expert Panelist for the Wall Street Journal. His research has been discussed in outlets including the print editions of The Economist, Wall Street Journal, Money Magazine, and SmartMoney.

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### Important Disclosures

Variable annuities are investments subject to market fluctuation and risk, including possible loss of principal. Your units, when you make a withdrawal or surrender, may be worth more or less than your original investment.

Variable annuities are long-term investments to help you meet retirement and other long-range goals. Withdrawal of tax-deferred accumulations are subject to ordinary income tax. Withdrawals made prior to age 59 ½ may incur a 10% IRS tax penalty.

The projections and other information generated in this Whitepaper regarding the likelihood of various investment outcomes are hypothetical in nature and do not reflect actual investment results and are not guarantees of future results.

It's important to remember that Monte Carlo simulation assumes that the future will be at least somewhat like the past — after all, we're using historical data in each simulation. In actuality the future may contain scenarios that are better or worse than anything considered by this tool. It's also important to remember that, despite the sophistication of this method, it makes a number of simplifying assumptions, so these results should never form the sole basis of a financial plan. In particular, the Monte Carlo methodology used assumes no relationship between asset-class returns from one year to the next. Monte Carlo simulation is one approach for modeling the range of possible future investment outcomes. Because other methodologies differ in certain assumptions, they may yield different results.

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