

The Role and Inner Workings of Variable Annuities with Guaranteed Lifetime Withdrawal Benefits in Retirement

Wade D. Pfau

Wade D. Pfau

is a professor of retirement income at the American College of Financial Services in King of Prussia, PA.

[wade.pfau@](mailto:wade.pfau@theamericancollege.edu)

theamericancollege.edu

KEY FINDINGS

- Although variable annuities with living benefits can be complex to understand, their basic workings become clear by distinguishing between the benefit base and the contract value.
- The fee drag of a variable annuity is a less relevant consideration than the amount of assets needed to comfortably meet a spending goal and the impact of the annuity on overall asset allocation.
- Retirees exhibiting the preferences associated with the risk wrap retirement income style may find value in considering a variable annuity as part of their retirement income plan.

ABSTRACT

A deferred variable annuity with a guaranteed lifetime withdrawal benefit is a retirement tool that can support protected lifetime income without having to annuitize assets until the contract value of the annuity depletes. This tool is controversial, with critics labeling it as too high cost and too complex for practical use. However, these annuities can have uses in a retirement income plan. For retirees expressing preferences for market growth, strategy commitment, asset liquidity, and longevity risk aversion, the variable annuity with a living benefit may serve as a suitable source for a protected lifetime income floor. Thus, this article aims to explain more about these potential uses and provide an understanding about how the guarantees for variable annuities work. Details such as the benefit base, contract value, rollup rate, step-up opportunities, and guaranteed withdrawal rates are explored to provide readers with a better sense of how to assess available variable annuity options and when they may be appropriate for a client.

This article explains how deferred variable annuities with guaranteed living withdrawal benefits operate and how they fit into retirement income planning. These are popular but polarizing financial products, and it is important for retirement practitioners to understand how these products work and the role that they can play in a retirement strategy. Such products are popular; in the second quarter of 2021, variable annuity sales totaled \$32.8 billion, more than half of the total \$62.8 billion

of annuity sales that quarter (Secure Retirement Institute 2021). In addition, the Setting Every Community Up for Retirement Enhancement (SECURE) Act, passed in 2019, helped pave the way for greater future use of variable annuities inside of qualified retirement plans. Such annuities are polarizing in the sense that many financial professionals view them as overpriced, complex, and unnecessary tools that are “sold” rather than “bought.” I seek to unwrap these complexities to provide financial professionals with a better understanding of how the products function, with the hope that this assists them in exercising proper due diligence about this product category.

Different retirement income approaches are viable in the sense that they work best for individuals with a specific set of preferences and attitudes. Retirees need to be comfortable and buy in to their strategy. As a first step, we consider the preferences of individuals who may be attracted to the product class of deferred variable annuities with guaranteed lifetime withdrawal benefits (GLWBs). Murguia and Pfau (2021) outline retirement income styles that can be matched to the competing viable approaches for retirement based on an individual’s preferences for sourcing their retirement income. One of four primary and viable retirement income styles is risk wrap, and a deferred variable annuity with a GLWB can match the preferences of individuals with this style. Within the Retirement Income Style Awareness (RISA) framework outlined by Murguia and Pfau (2021), two other styles—total return and income protection—tend to display more naturally consistent preferences for retirement income. Those favoring total returns tend to feel comfortable relying on stock market growth to support their retirement income (probability based) and prefer to keep options open for new opportunities or plan changes (optionality). Spending from diversified investment portfolios meets the preferences for these individuals. In contrast, people with an income protection style favor contractual protections (safety first) over relying on market growth and are more comfortable committing to a lifetime strategy that solves their retirement income need (commitment). Income protection explains the world of simple income annuities that exchange a premium for a set floor of ongoing lifetime income.

Although the language of the RISA profile is a more recent development, the creation of variable annuities with income riders can be understood as an effort by the retirement profession to design tools that match the less commonly correlated behavioral preferences of individuals with a risk wrap style. Risk wrap represents a hybrid style that combines a probability-based comfort with relying on market growth and a commitment orientation. These individuals have mixed feelings about the role of stock market growth in their retirement strategy. While they maintain a probability-based outlook with a desire for market participation, they also want to commit to a solution that provides a structured income stream over their lifetime. They back-load retirement income, which reflects a fear of outliving their assets (i.e., longevity risk aversion) and a concern about not being able to cover their core retirement expenses.

Since the 1990s, the insurance industry has created structured tools that are more aligned with this combination of preferences. Variable annuities with living benefits can be designed to offer upside growth potential alongside secured lifetime spending even if markets perform poorly. Such tools also maintain technical liquidity of the underlying assets as deferred annuity assets remain on the balance sheet and can be managed, with their values and allocations shown on portfolio statements. There thus are commitment and back-loaded protection, but these strategies can also be reversed, with remaining assets returned to those individuals who decide that they no longer want or need lifetime spending protection. As a means of accommodating the concerns of real-world retirees with the risk wrap profile, deferred variable annuities with lifetime income protections developed as a compromise between downside protection and upside potential, providing a type of structured put option on the stock market to support sustainable retirement spending.

The appeal to retirees is based on the combination of downside protection with a protected income stream, upside growth potential through the underlying investments in annuity subaccounts, and maintenance of the liquidity of the underlying assets while also offering the potential for tax deferral when compared with taxable investments. For variable annuities, retirees can view their account values; they can continue to invest in funds (technically called variable insurance trusts but similar to mutual funds) within the annuity subaccounts; and any funds remaining at death are generally available to beneficiaries as a death benefit—all while ensuring protected retirement income for life.

Lifetime income insures against outliving assets in retirement, which results from living too long, experiencing poor investment returns, or both. In addition, in some situations, variable annuities might help to achieve more efficient outcomes in retirement by providing a better combination of spending and legacy funds. These outcomes relate to asset allocation and whether it may change when an income guarantee is in place. Income guarantees provide greater relative benefits to retirees who are willing to invest more aggressively with the spending protection in place.

Limited academic research addresses variable annuities. Most recently, Friedberg and Webb (2021) analyze the impact of variable annuity use on a representative household under different scenarios for capital market returns, asset allocation, age to initiate the income benefit, and modeling for the income step-ups with the annuity strategy. For risk-averse households, annuity equivalent wealth (i.e., the amount of additional wealth required for a household without an annuity to feel equally happy) is positive for a variety of scenarios. This result confirms a finding by Steinorth and Mitchell (2015) that variable annuities with living benefits can improve household well-being relative to a strategy that excludes such annuities. In addition, Huang, Milevsky, and Salisbury (2014) provide guidance for consumers on how to maximize the benefits received from a living benefit on a variable annuity—in most circumstances, they suggest beginning guaranteed withdrawal payments as soon as possible. Friedberg and Webb (2021) counter this point, suggesting that household utility may be improved in some scenarios by delaying the start of guaranteed income distribution to benefit from growth in that eventual income.

The features and workings of deferred variable annuities with income riders can be rather complex. Prospectuses about variable annuities can be hundreds of pages long. Features are not standardized among companies, making comparisons more difficult. Because a variable annuity has many moving parts—and because consumers tend to latch on to certain characteristics and downplay other important characteristics—different providers seek to tweak the characteristics of their product offerings to better appeal to consumers while also adjusting other less salient features in a less attractive direction.

For investors just starting to investigate deferred variable annuities, the complexities relate to understanding how the income guarantee works and how its fees are structured. A few key terms include contract value of assets, guaranteed benefit base, possibility of step-ups, and rollup rate applied during the deferral period. Different companies use various names for these features, so some translation may be necessary when reviewing a specific product.

This discussion includes five general categories: (1) how guarantees grow during the deferral period, (2) how guaranteed withdrawals are determined and how they can grow during the distribution period, (3) how the death benefit works, (4) how the insurance company manages the risk it creates by offering the guarantee, and (5) how a consumer evaluates different annuity products with varying downside protections and upside exposure.

DEFERRAL PERIOD

A potentially confusing way to classify annuities depends on whether they are immediate or deferred. The confusion relates to the idea that this classification is not about when guaranteed income begins but rather when the act of annuitization takes place. Some deferred annuities could provide income immediately through structured lifetime payments while some immediate annuities may defer income payments. For the former, variable annuities with income riders are a type of deferred annuity, even if the deferral period is skipped and guaranteed distributions start immediately. They are still called deferred annuities in this case because technically the contract does not annuitize into a guaranteed income stream from the insurer's general account until the contract value of the underlying assets falls to zero. This allows for greater control over decisions related to the annuity assets, in terms of both how they are invested and how distributions are taken. While assets remain, the retirees spend their own funds and hold an option to receive an annuitized lifetime income stream as defined by the benefit in the event that the contract value of the annuity is depleted.

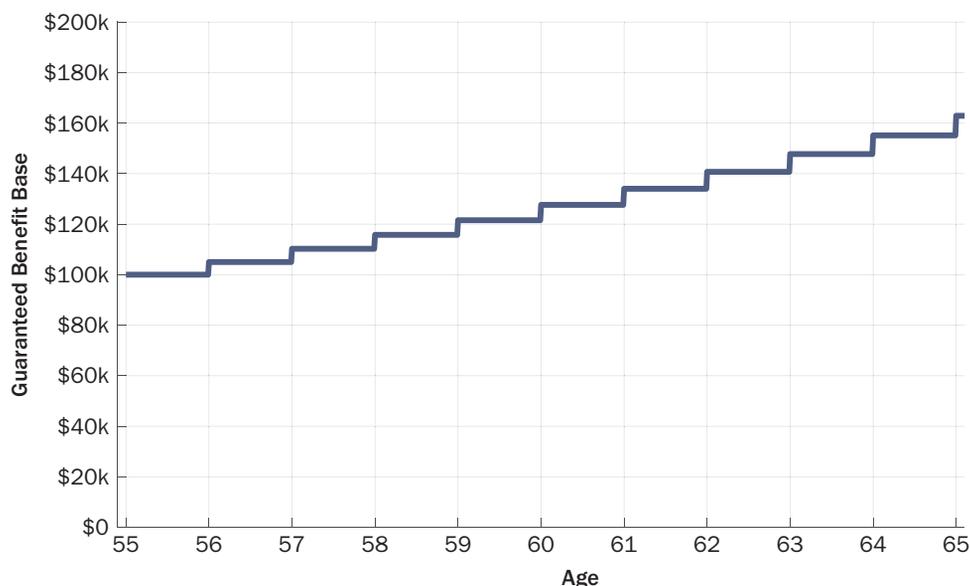
For deferred variable annuities with living benefits, we begin by analyzing the growth process for the guaranteed benefit base during the deferral or accumulation period before distributions begin (when there is a distribution). Indeed, this section is only relevant to clients who do not wish to take income now but rather income soon or income later. For these latter groups, the interaction between what happens in the deferral period and the distribution period impacts their experience. This growth is important because it is subsequently used to determine the amount of guaranteed lifetime income provided by the annuity.

Deferred variable annuities with income guarantee riders generally support the ability to lock in a guaranteed growth rate on the benefit base during the accumulation period, before guaranteed distributions begin—including the ability to define the benefit base as the high watermark of the contract value of the underlying assets on contract anniversary dates. The benefit base is a hypothetical number used to calculate the amount of guaranteed income paid during the withdrawal phase. The benefit base is distinct from the contract value of assets (i.e., what the owner could access based on actual account growth net of fees and any surrender charges).

For example, if the rollup rate for the benefit base is an annually compounded 6%, the value of the benefit base would double in approximately 12 years. The benefit base could grow even larger if the contract value increased on the relevant dates (i.e., when the benefit base figure is checked). Conversely, the actual contract value of the underlying assets is determined by market performance. If the market has underperformed and if 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: the benefit base is larger than the contract value. In such a case, the owner will be more compelled to continue paying for the rider and to receive the guaranteed income as calculated on this higher benefit base.

On the other hand, if the market has performed well, the contract value of the underlying assets may be close to, or the same as, the value of the benefit base. In this case, the retiree may consider whether it is worthwhile to begin taking distributions with the income guarantee, return the contract value of the underlying assets to an unprotected investment portfolio, or exchange into a different annuity with better withdrawal opportunities for the contract value.

In general, the benefit base can grow at the higher of either a guaranteed rollup rate or the high watermark achieved through investment growth of the contract value for the underlying assets held inside the annuity. The interaction between the two can get confusing because rollups and step-ups are not interchangeable terms.

EXHIBIT 1**Guaranteed Benefit Base for \$100,000 Premium in a Deferred Variable Annuity with a 5% Annually Compounded Rollup Rate**

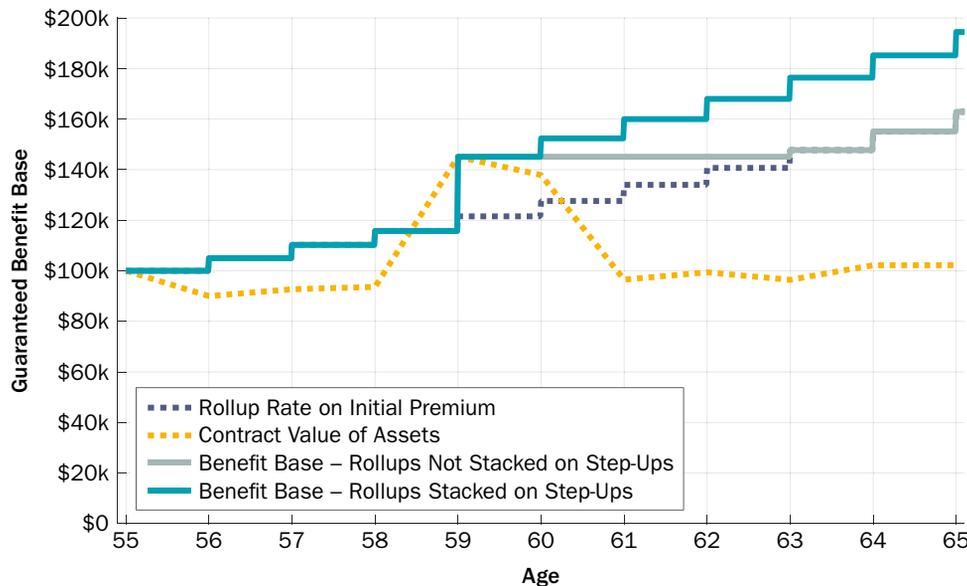
Rollups are a guaranteed minimum growth rate for the benefit base, and step-ups are increases for the benefit base triggered when the contract value of the underlying assets in the annuity subaccounts achieves a new high watermark value.

For instance, we can consider a rollup rate that is applied annually on the contract anniversary date. If a variable annuity offers a 5% guaranteed compounded rollup rate during the deferral period, then the benefit base supported by a \$100,000 premium would grow to \$127,628 after 5 years ($100,000 \times 1.05^5$) and to \$162,890 after 10 years ($100,000 \times 1.05^{10}$).

If this example instead used a 5% simple growth rate, then 5% of the initial premium would be added to the benefit base after each year, leading to \$125,000 after 5 years and \$150,000 after 10 years. The longer the deferral period, the more opportunity a compounded rollup rate has to move ahead, building on past growth (relative to a simple rollup rate on the initial premium). For instance, given these numbers, a 5% compounded growth rate would beat a 6% simple growth rate after 10 years because the latter would only grow to \$160,000.

Exhibit 1 shows an example of \$100,000 placed into a variable annuity at age 55 that offers a 5% annual compounded growth rate on the benefit base. As mentioned, after 10 years, the benefit base grows to \$162,890. If the contract value of the underlying assets never increases to exceed this guaranteed rollup rate when checked on the relevant dates, then this rate would reflect the benefit base for the annuity.

It is worth emphasizing that the guaranteed rollup rate is not a guaranteed investment return. The guaranteed rollup rate does not apply to the contract value of assets—only to the benefit base used to calculate guaranteed income amounts. This detail is a constant source of confusion for individual investors. Moreover, this rollup rate is applied annually on the anniversary of the date that the contract went into effect, which is also the date when the benefit base would be vested at the new higher value. Some variable annuities apply the rollups more frequently (e.g., daily, monthly, or quarterly). With compounding, more frequent rollups can provide an edge because of the greater opportunity for interest to accumulate on interest. More frequent rollups might still only vest on the contract anniversary date. Guaranteed rollup rates for the

EXHIBIT 2**Comparison of the Benefit Base with Rollups Stacking on Step-Ups for a Guaranteed Benefit Base for a \$100,000 Premium in a Variable Annuity with a 5% Annual Compounded Rollup Rate**

benefit base generally end once guaranteed distributions from the contract begin or otherwise may stop after a certain number of deferral years.

The benefit base also can increase because the contract value of the underlying assets grows to achieve a new high watermark that exceeds the value of the guaranteed benefit base produced through rollups. We must consider how frequently these new high-watermark step-up possibilities are checked for the benefit base and when they vest. Most commonly, these step-ups are applied annually for contract value growth on the contract anniversary date. If the contract is worth more than the guaranteed benefit base on the contract anniversary date, then the benefit base is adjusted upward to match the contract value at that time. In these cases, if the contract value reaches a new high watermark earlier in the year but then drops by the anniversary date, the higher earlier value would not matter. Only the value on the designated date is used to determine whether a new high watermark has been achieved.

As with rollups, the ability to apply step-ups more frequently (e.g., daily, monthly, or quarterly) is valuable to the annuity holder. This ability creates more opportunities for growth in the contract value to achieve new high watermarks for the benefit base.

A final consideration for deferrals is how the rollup rate reacts to step-ups for the benefit base. Two basic options are available. The rollup rate might be applied only to the original premium, or it might stack on top of new high watermarks achieved through asset growth. The latter case is more advantageous to the annuity owner. The easiest way to understand this reasoning is with an example.

Exhibit 2 provides such an example for a \$100,000 premium placed into a variable annuity with a 10-year deferral period that offers a 5% annual compounded rollup rate that is vested on each contract anniversary, as shown in Exhibit 1. The contract value for the underlying annuity assets is also shown in Exhibit 2. We choose the growth of the contract value for this example to illustrate the difference when stacking the rollup rate on step-ups. The contract value trails the guaranteed rollup rate until age 59 when a very large market return pushes the contract value well above the benefit base. This market growth creates a step-up to the new high watermark

for the benefit base. Then, the contract value subsequently declines and trails the benefit base for the remainder of the deferral period.

With that step-up at age 59, the rollups may respond in two ways. Without stacking, the rollup continues to apply only to the original premium, and the benefit base stays at the high watermark level achieved at age 59 until age 63 when the cumulative rollups once again allow the benefit base to grow. In this example, the benefit base at age 65 reaches the same \$162,890 value. For a temporary period between ages 59 and 63, the benefit base is larger, which could be beneficial if the owner decided to begin lifetime distributions earlier than planned, but it otherwise does not impact the amount of guaranteed income if distributions begin at 65.

We can observe how stacking leads to a much better outcome in this example. With stacking, once the new high watermark is achieved at age 59, the rollup rate is applied to this new high watermark rather than only to the original premium, allowing for greater subsequent growth of the benefit base at the rollup rate from that new high watermark. In this example, stacking allows the benefit base to grow to \$194,477 at age 65. This stacking thus lays a foundation for 19% more income from the annuity.

As a last thought in this section, it is also worth mentioning one other way that variable annuities may be designed to offer a higher income rate for a longer deferral, moving away from the hypothetical benefit base and the rollup rate. Instead, a lifetime withdrawal percentage, which is still defined by age bands, is determined by the age that the benefit is purchased rather than the age that income distribution begins. In this case, rather than using a rollup rate with a benefit base, a deferral credit increases the withdrawal rate for each year that the owner defers the start of lifetime income distributions. When the lifetime distributions begin, they are set as a percentage of the contract value at that time, with the percentage rising over time in response to the deferral credits. In the rest of this article, we revert to explanations based on the more common approach of using a rollup rate and benefit base.

DISTRIBUTION PERIOD

The deferral period ends once guaranteed lifetime distributions commence. We then enter the distribution period. Guaranteed income is set using an age-based guaranteed withdrawal or payout percentage rate applied to the value of the benefit base. The guaranteed withdrawal rate multiplied by the benefit base sets a guaranteed distribution amount supported for life, even if the contract value of the underlying assets is depleted. Guaranteed distributions may even increase through step-ups if new high watermarks are reached for the underlying asset base on the designated checking dates.

For deferred variable annuities with income riders supporting a GLWB, the guaranteed withdrawal rates or payout rates are most typically based on the age when lifetime guaranteed distributions begin and on whether the distribution is taken by a single individual or a couple. These payout rates can vary among companies and even for different versions of variable annuities offered by the same company. The rates are established at the time of the contract and do not change for that contract holder, even though the rates may change over time for new purchasers.

As a simple example, a company might offer the following payout rates to single individuals based on the age that lifetime withdrawals begin: 4.5% for ages 60 to 64, 5% for ages 65 to 69, 5.5% for ages 70 to 79, and 6.5% for age 80 and older. For couples, payout rates would generally be 0.5% less (e.g., 4.5% at 65) and would be based on the age of the younger person. For couples, another possibility could be payout rates that remain the same as those for single people, but with a higher

fee charged to support the guarantee over the longer expected joint lifetime. Variable annuity payouts usually do not make a distinction between genders (which would benefit longer-lived women relative to men).

The payout rates on variable annuities at different retiree ages are typically less than the payout rate offered by an immediate annuity purchased at the same age (although there are occasional exceptions). This difference can be expected because the variable annuity continues to provide liquidity for the underlying assets and thus the potential for upside growth in the guaranteed income. However, the question remains: how much lower is the payout rate for a variable annuity relative to an income annuity? We return to this issue later when we delve into how to think about the upside potential of a variable annuity.

When the time comes to begin taking guaranteed withdrawals, it is worthwhile to investigate whether applying the contract value of the annuity assets to a higher payout rate possibly available from other annuities could result in a higher guaranteed income when compared to applying a potentially lower payout rate to the annuity's benefit base. For instance, consider a variable annuity with a \$1 million benefit base and a 4.5% payout rate at the current age. If, at this age, a different annuity is offering a 5% payout when the owner wishes to start income distribution, then the owner would be better off exchanging to the other annuity if the contract value is greater than \$900,000 (as that would guarantee more than \$45,000 of annual income) but remaining with the existing annuity if the contract value is less than \$900,000 (as \$45,000 is guaranteed from the benefit base).

It is also important to consider the joint impacts of rollup rates and payout rates on the amount of guaranteed income the annuity can support. Milevsky (2009) describes the separate presentation of rollup rates and guaranteed withdrawal rates as similar to telling consumers the temperature in Celsius when individuals can only make sense of temperatures in Fahrenheit. In this case, what a retiree understands is the amount of income guaranteed by the annuity (or the equivalent internal rate of return provided by the annuity payments).

It may not be immediately obvious whether an annuity with a 5% rollup rate and 5% withdrawal rate is better than an annuity with a 4% rollup rate and a 6% withdrawal rate. The answer also depends on the length of the deferral period before income begins; longer deferral periods increase the relative importance of the rollup rate while shorter deferral periods instead focus more on the withdrawal rate.

Exhibit 3 introduces more clarity on how to better understand the intricacies of rollup rates and withdrawal rates for someone placing a \$100,000 premium into a variable annuity and deferring for 10 years before distributions begin. For instance, a 4% rollup and 6% withdrawal rate support \$8,861 of guaranteed annual lifetime income, which is quite a bit more than the \$8,144 provided by the 5% rollup and 5% withdrawal combination. The former delivers more guaranteed income, which is the whole point of a lifetime income guarantee. To be clear, fees and investment opportunities also matter in determining upside potential, but for now we only consider guaranteed income levels if no step-ups are ever realized.

Individuals considering variable annuities may tend to focus on the guaranteed rollup rate. They may even misunderstand it to mean a guaranteed return on their investment or on contract value rather than a guaranteed return on a hypothetical benefit base that is then used to calculate guaranteed income. This misunderstanding creates room to maneuver; companies can raise the headline rollup rate that receives greater consumer attention while more subtly reducing the subsequent withdrawal rates attached to the benefit base. With this strategy, companies avoid financial responsibility for supporting a higher guaranteed income level than a retiree might otherwise expect with a higher rollup rate.

EXHIBIT 3

Guaranteed Income Supported by a \$100,000 Premium with a 10-Year Deferral Period before Income Begins

		Withdrawal Rate					
		Rollup Rate	4.0%	4.5%	5.0%	5.5%	6.0%
Compounded	4.0%		\$5,921	\$6,661	\$7,401	\$8,141	\$8,881
	4.5%		\$6,212	\$6,988	\$7,765	\$8,541	\$9,318
	5.0%		\$6,516	\$7,330	\$8,144	\$8,959	\$9,773
	5.5%		\$6,833	\$7,687	\$8,541	\$9,395	\$10,249
	6.0%		\$7,163	\$8,059	\$8,954	\$9,850	\$10,745
	6.5%		\$7,509	\$8,447	\$9,386	\$10,324	\$11,263
	7.0%		\$7,869	\$8,852	\$9,836	\$10,819	\$11,803
Simple	5%		\$6,000	\$6,750	\$7,500	\$8,250	\$9,000
	6%		\$6,400	\$7,200	\$8,000	\$8,800	\$9,600
	7%		\$6,800	\$7,650	\$8,500	\$9,350	\$10,200
	10%		\$8,000	\$9,000	\$10,000	\$11,000	\$12,000

If consumers are confused and only concentrate on the annuity that offers the best rollup rate, then they may overlook the opportunity to achieve the highest guaranteed income for their premium dollars. It is important to focus on the guaranteed income provided by the rollup and withdrawal factors rather than trying to make some determination in isolation about the combination of factors that *sounds* better.

Another issue is that variable annuities generally make a distinction between distributions that are covered by the lifetime income guarantee rider and one-time distributions that are not part of the guarantee. Nonlifetime distributions may be allowed before guaranteed income distribution begins. That distinction is important because the former would generally allow rollups to continue rather than ending once guaranteed distributions begin (as most rollups do). Moreover, nonlifetime distributions exceeding the guaranteed level are allowed after the guaranteed distributions begin, but this approach proportionately reduces the subsequent guaranteed distribution amounts.

Typically, variable annuities terminate their guaranteed rollup provisions once guaranteed lifetime distributions commence. Step-up opportunities continue for the guaranteed benefit base whenever the underlying contract value of assets reaches a new high watermark on one of the relevant dates. When step-ups can happen more frequently than annually, the usual process is looking back on the contract anniversary date to determine the high watermark on the relevant dates over the past year and then vesting any step-up at that time. Then, applying the guaranteed withdrawal rate to the higher benefit base on the anniversary date allows for larger subsequent lifetime guaranteed withdrawals. It is important to keep in mind that step-ups become less likely after distributions begin because step-ups require the contract value to achieve new high watermark values net of distributions and fees. Pfau (2013) describes simulations of this step-up process.

DEATH BENEFITS

The standard death benefit for a deferred variable annuity is the greater of either the contract value of any remaining assets at death or the total premiums paid less distributions received by death. The death benefit is paid to the beneficiary.

In addition to optional withdrawal benefit riders, many deferred variable annuities also offer optional death benefit riders that create an opportunity for a payout larger

than the standard death benefit. Investors should carefully assess these options because they could be counterproductive for those focused on receiving the most guaranteed income from their variable annuity. For instance, a common death benefit rider could support a death benefit equal to the full value of the annuity premiums if at least \$1 remains in the contract by a specified advanced age. Each individual must consider whether a death benefit is a wise choice if the emphasis is otherwise placed on maximizing the spending power afforded by an income guarantee.

With a focus on maximizing spending power, a willingness is maintained to deplete the underlying contract value for assets. However, to keep the death benefit, the contract value must stay above zero, which could create complications because the income guarantee could never be activated if the death benefit is to be maintained. Such a death benefit could be more worthwhile for individuals who are not seeking to derive the most possible value from their income guarantee, such as those with a strategy to pay required minimum distributions from the underlying assets while preserving their initial value as a death benefit. In general, optional income benefit riders and death benefit riders should not be combined because they serve different purposes.

MANAGEMENT OF RISKS FOR THE INCOME GUARANTEE

Providing a GLWB is a risky endeavor for the insurance company, which must manage both longevity and market risks because the company is obligated to provide lifetime income payments at the guaranteed level if the underlying assets held within the annuity are depleted. The greater the investment volatility and the higher the guaranteed withdrawals allowed by the insurance company, the greater the cost is for creating a risk management framework to support that guarantee. Companies can use several methods to manage these risks.

First, companies can create a strong culture of financial performance and risk management. This approach may help gain an edge in obtaining efficiencies around supporting the guarantees in the least costly way. Consumers may find it hard to distinguish much in this regard among the leading insurance companies other than to assess their strength, size, and past performance in supporting income guarantees during market downturns. Especially as the income guarantees on variable annuities are not covered by the state guarantee associations protecting fixed annuities, investors must take care to choose a company that is likely to stay in business and retain the ability to support its guarantees.

As well, beyond the company's culture and approach to risk management, insurance companies generally have the following levers for managing the risks associated with supporting a lifetime income guarantee:

- Supporting a lower guaranteed income amount.
- Choosing high-quality managers for the investment subaccounts.
- Limiting the volatility allowed within the investment subaccounts.
- Increasing fees for the variable annuity and the income guarantee rider.

Companies may reduce their obligations by encouraging consumers to focus only on one detail, such as a guaranteed rollup rate, rather than on the guaranteed level of income provided through the interaction of annuity parameters. Guarantees can be weakened by using a lower rollup rate, vesting the rollups less frequently, not stacking rollups on step-ups, or connecting the benefit base to lower distribution rates. However, these approaches may only go so far in reducing company obligations because they rely on behavioral mistakes by purchasers who focus on only one lever of

the income machine. Companies seeking to provide competitive levels of guaranteed income must manage these accepted risks through investment controls and fees.

The risk to the insurance company in supporting an income guarantee grows as the contract value declines and falls further below the guaranteed benefit base. The insurance company maintains the responsibility to continue funding the guaranteed income levels even if the underlying portfolio is depleted. Consequently, as the contract value of remaining assets falls relative to the guaranteed benefit base used to determine income, the risk to the insurance company increases. Clearly, insurance companies prefer a contract value that is strong and close to the benefit base so that they are less exposed to the costs of provision of the lifetime income guarantee.

The ability to invest more aggressively is a clear advantage provided to the retiree by an income guarantee, but this is a risk that must be managed by the insurance company offering the guarantee. Investing aggressively creates more upside potential for the retiree. Investment growth that leads to step-ups produces both a larger benefit base and a higher contract value for assets. Retirees then only experience a portion of the downside risk. Market losses reduce the contract value, but the income guarantee provides spending power if the assets are depleted through a combination of portfolio losses and distributions. The income guarantee behaves as a type of put option on the stock market because it supports upside growth while reducing the potential harm to the lifetime standard of living that results from market losses.

Ultimately, while the underlying contract value of assets remains positive, retirees are spending their own money. The insurance company pays from its own resources when the contract value depletes. Contract value depletion is the trigger for annuitization, and that is why these variable annuities are classified as deferred annuities. Insurance companies can try to control this exposure to market volatility and capital losses by limiting the total allocation allowed to risky assets, choosing less volatile funds to include as part of the subaccount options, or directly managing the level of volatility exposure through volatility-managed investment funds or through dynamic asset allocation that shift assets away from equities during times of market stress.

Variable annuities will vary by their depth of investment offerings and by the constraints placed on these offerings. Most will provide funds from a variety of leading mutual funds companies. Insurance companies tend to carefully select and manage the fund choices within their annuities, with an eye to finding good performers. The insurance companies are incentivized to avoid underperforming or poorly managed funds because they could cause contract values to be depleted more quickly, forcing the insurance company to make good on its guarantees.

As for constraints, the simplest one is creating a maximum allowed allocation to risky investments such as stocks. Annuity holders may have investing freedom to choose among the funds within the annuity universe but would be restricted from increasing the overall risky allocation above some specified limit (e.g., 60% or 70%). Some companies also require that 10% of premiums remain in a secured value account that earns a fixed interest amount based on short-term interest rates.

In addition, fees are the headline mechanism for managing the guarantee risk. Fees can be used to purchase financial derivatives and support other forms of risk management for the guarantee.

Deferred variable annuities generally have several types of ongoing fees. First, some fees relate to the underlying fund expenses that would be included with any mutual fund investment. The only issue to consider here is whether the funds within the subaccounts have elevated fees because of the inclusion of 12b-1 fees in their expense ratios and whether investment options available to the individual outside of the variable annuity also include 12b-1 fees. These fund fees are charged on the contract value of underlying assets and would end if the contract value is depleted.

Second, another type of fee relates to mortality and expense charges for the insurance company. These fees help support the risk pooling and business costs of the insurance company as well as basic annuity death benefits. These fees are also typically charged on the contract value of assets. Annuities may also impose a small fixed annual fee, at least for accounts with lower balances.

Third, a type of fee that may exist temporarily is the contingent deferred sales charge (or surrender charge) for investors seeking nonlifetime distributions above the allowed level in the early years of the contract. Surrender charges receive much of the criticism related to fee levels for variable annuities. Such annuities are liquid (i.e., they may be surrendered, with the contract value returned as an excess distribution above the guaranteed distribution level), but in the early years of the contract, surrender charges may limit the portion that can be returned without paying a fee. For instance, surrender charges could work on a sliding scale starting at 7% in the first year that the annuity is held and then gradually declining by 1% a year and reaching zero after the seventh year. In this case, after the seventh year that the annuity is held, the surrender charges end, and the contract value is fully liquid in all subsequent years.

The purpose of these charges is to help the insurance company offset the fixed costs involved in setting up a new annuity contract that can otherwise only slowly be offset over longer periods through the ongoing mortality and expense charges of the annuity. The largest of these fixed costs is the commission paid to the advisor selling the variable annuity. Surrender charges do not apply to any guaranteed lifetime distributions, and often variable annuities allow free annual withdrawals of up to 10% of the assets before surrender charges are imposed. Surrender charges may also be waived for required minimum distributions when held in qualified retirement plans.

Newer annuities designed for noncommission advisors usually have lower fees, in part because the advisors charge for their services separate from the annuity rather than being paid through the annuity. No longer is an upfront commission paid by the insurance company. Mortality and expenses fees should also be lower for these no-commission variable annuities because a portion of the fees is no longer allocated to pay the advisor.

Furthermore, optional riders providing living benefits through a lifetime withdrawal guarantee or a stronger-than-standard death benefit guarantee require an additional ongoing fee. The rider is charged while the contract value remains positive. Rider charges end after the account is depleted, and payment of the guaranteed benefits continues, but with insurance company resources.

Rider fees can be confusing because they may be charged in three ways. First and most expensive, the rider is charged on the benefit base. As the contract value approaches zero, the rider cost increases as a percentage of remaining assets and depletes the contract value more quickly. The two other options are charging the rider on the contract value of assets or on a declining benefit base equal to the benefit base less cumulative guaranteed withdrawals. Charging on the contract value could be more expensive in scenarios with market upside and strong growth for the contract value, but charging on the declining benefit base could be more expensive if the contract value decreases quickly and if there is a long deferral period.

For these optional riders, it is clearly worthwhile for investors not to pay for riders that they do not intend to use. It is also important to keep in mind that most variable annuity contracts allow provisions for these fees to be increased (or decreased), so investors should take note of the maximum possible charges allowed by the contract.

With these various fees, total variable annuity fees possibly could add up to as much as 4%. These fees, along with surrender charges, are why variable annuities have developed a reputation as a high-cost financial product.

The message about fees is worth digging into further, as it presents one of the biggest objections to variable annuities compared to an unprotected investment portfolio.

However, it is important to frame the issue of variable annuity fees in terms of the potential value that the variable annuity can provide to a retirement income plan. Variable annuities may have higher ongoing charges than nonannuity investment portfolios, but a portion of those fees pays for the assurance of a lifetime income in the face of longevity and market risks.

Variable annuities maintain a contract value that has a higher associated cost, but the focus should be on how many assets must be earmarked for different retirement goals. With risk pooling, an income rider may allow fewer assets to be earmarked to meet retirement spending needs, and therein lies its value. A variable annuity with an income rider is then able to pay a guaranteed income for life based on a fixed percentage of the hypothetical benefit base. The most compelling aspect of the variable annuity is simple: even in cases when the contract value of the underlying assets is depleted, the income guarantee continues to be paid for the lifetime of the annuitant.

More broadly, in the context of the retirement income plan, focusing on the internal costs of a variable annuity is not the best way to frame the problem that we are attempting to solve. Instead, we should consider whether an investments-only strategy with lower internal fees is preferable if its approach to managing longevity and sequence risks means that the retiree must either spend less or delay financial independence because of the necessity to earmark a larger overall asset base to ensure that retirement spending goals can be covered. That is the context in which to assess fees: can they support better outcomes through risk pooling that reduces the overall costs of the plan in terms of the asset base required to make the investor comfortable about meeting the financial goals of retirement.

INCOME GUARANTEES, RISK CAPACITY, UPSIDE POTENTIAL, AND ASSET ALLOCATION

If the investor maintains the same asset allocation both inside and outside of the variable annuity, then the additional fees for a variable annuity can be expected to deplete the underlying value of the assets more quickly than if they were held in an unprotected investment account with lower fees.

However, this outcome changes if one accepts the notion that having an income guarantee in place can support using a higher stock allocation within a variable annuity. In this case, when markets do well in retirement, the additional exposure to the risk premium can more than offset the higher costs of the variable annuity to allow for greater overall growth in assets. If markets perform poorly in retirement, the additional costs within the variable annuity could cause a depletion of assets sooner than otherwise would be expected. But with poor returns, the investments-only portfolio would be on track for depletion shortly thereafter.

With the variable annuity assets, at least the income guarantee continues to support spending after the contract value is depleted. With an investments-only approach, spending power ends. Over time, variable annuities with income guarantees could have either lower remaining wealth because of fees or higher residual wealth if the guarantee moves an investor to accept a higher stock allocation and if stocks perform well.

The assumptions about asset allocation for guaranteed funds and unguaranteed funds are incredibly important. Naturally, retirees with income guarantees feel more comfortable about accepting a more aggressive asset allocation, and approaches ideally should be compared by using the asset allocations that a retiree would choose for both a guaranteed and unguaranteed approach. This will be individual specific. Milevsky and Kyrychenko (2008) provide research based on over 1 million variable annuity policyholders, showing that those with optional income guarantees were willing

to hold about a 5% to 30% higher stock allocation than those without guarantees on their variable annuities. For instance, someone willing to hold 40% stocks without a guarantee might increase their stock allocation to between 45% and 70% (if allowed) with an income guarantee in place.

When the income guarantee is supported with actuarial bonds, the risk capacity of retirees increases because their retirement standard of living is less vulnerable to a market downturn. This circumstance can provide the capacity to use a higher stock allocation when a guarantee is in place, both inside and outside of a variable annuity: inside because the income guarantee protects income on the downside while still offering upside potential and outside because the income guarantee reduces the harm created if portfolio assets are depleted.

A retiree may be willing to invest more aggressively within the variable annuity than with an investments-only strategy. The variable annuity owner has the upside potential to grow the asset base and increase guaranteed income with a higher stock allocation while knowing that the retirement income is protected and sustainable even if the market is performing poorly in the pivotal early years of retirement.

The income riders on variable annuities provide the ability to receive mortality credits, which can reduce the asset base required to support a lifetime spending goal. The rider fees paid for the income guarantee buy insurance that the spending will be protected in case purchasers live longer than expected, experience sufficiently poor market returns that they outlive their underlying investment assets and cannot sustain an income for life, or both.

A higher variable annuity fee may provide stronger protections or more upside potential. Retirees should seek to evaluate variable annuities along the tradeoff between choices that can provide the most certainty with the lowest cost to potential upside opportunities.

In evaluating a variable annuity guarantee, it is important to first start with the level of guaranteed income if no upside is ever achieved. This calculation can be compared with the guaranteed income from an income annuity offering a cash refund, which is most comparable to the standard death benefit for variable annuities. The difference in payouts between the two choices better relates to the cost of upside and liquidity while the retiree is alive. Most frequently, the variable annuity guaranteed withdrawal rate will be less than an income annuity. The differential reflects the guaranteed income that an investor would give up to receive the upside potential and liquidity in the contract.

With the investment options and annuity features, how likely is it that the contract value can grow, and how important is it to the retiree to maintain the liquidity provided by the contract for those assets? Regarding liquidity, we must remember that we may not be seeing true liquidity if those assets are earmarked for income because excess distributions beyond the guaranteed amount reduce the subsequent amount of guaranteed income. However, if a retiree values this liquidity nonetheless, with a preference for technical liquidity, then comparing the amount of guaranteed income lost to obtain the liquidity (and upside) helps to quantify the tradeoff for the decision between income annuities and deferred variable annuities with income guarantees.

CONCLUSIONS

We outline many factors that impact deferred variable annuity performance, such as rollup rates and the frequency of their vesting as well as how long they are applied, step-ups and their frequency, applicability of rollups stacking on step-ups, guaranteed withdrawal rates, death benefits, investment choices, allowed asset allocation and the range of investment offerings, use of volatility-managed strategies, and fees for

the variable annuity and optional riders and the scope of their application. We hope that these explanations provide a greater understanding about how variable annuities with living benefits work to support a retirement income plan.

This context is also important because some retirees' investment style for sourcing retirement income reflects a set of preferences that a variable annuity with a living benefit can support. This risk wrap style is identified by Murguia and Pfau (2021) and includes preferences for market growth, commitment, technical liquidity, and back-loading for retirement income. A variable annuity with a living benefit provides the opportunity to gain exposure to market growth while also supporting structured lifetime income and asset liquidity. Although many opinions exist on different retirement strategies and tools, some retirees can be properly served by including a competitively priced variable annuity as part of their retirement income strategy.

REFERENCES

- Friedberg, L., and A. Webb. 2021. "A Primer on Variable, Fixed Indexed, and Registered Index-Linked Annuities: What Economists and Financial Professionals Need to Know." Research Paper for the Retirement Income Institute at the Alliance for Lifetime Income.
- Huang, H., M. A. Milevsky, and T. S. Salisbury. 2014. "Optimal Initiation of a GLWB in a Variable Annuity: No Arbitrage Approach." *Insurance: Mathematics and Economics*. 56: 102–111.
- Milevsky, M. A. 2009. "Annuity Analytics: What Is a Guaranteed Rate Really Worth?" *Research Magazine* (August).
- Milevsky, M. A., and V. Kyrychenko. 2008. "Portfolio Choice with Puts: Evidence from Variable Annuities." *Financial Analysts Journal* 64 (3): 80–95.
- Murguia, A., and W. D. Pfau. 2021. "Selecting a Personalized Retirement Income Strategy: A Model Approach." *Retirement Management Journal* 10 (1): 46–58.
- Pfau, W. D. 2013. "Analyzing an Income Guarantee Rider in a Retirement Portfolio." *Journal of Retirement* 1 (1): 100–109.
- Secure Retirement Institute. 2021. "Second Quarter US Annuity Sales Jump Nearly 40%, Marking the Highest Sales in More than a Decade." Security Retirement Institute, July 27. <https://www.limra.com/en/newsroom/news-releases/2021/secure-retirement-institute-second-quarter-u.s.-annuity-sales-jump-nearly-40-marking-the-highest-sales-in-more-than-a-decade/>.
- Steinorth, P., and O. S. Mitchell. 2015. "Valuing Variable Annuities with Guaranteed Minimum Lifetime Withdrawal Benefits." *Insurance: Mathematics and Economics* 64: 246–258.