Measuring the Value of a Guaranteed Lifetime Withdrawal Benefit

by Garth A. Bernard

Abstract: *According to LIMRA, most new variable annuities are sold with some form of living benefit rider that assures the buyer that certain benefits will be available regardless of market performance. However, some guaranteed benefits are not paid in a cash lump sum, making it difficult for the lay investor to determine the value of the guarantee. This paper provides a methodology for determining the value of a guaranteed lifetime withdrawal benefit (GLWB) as a simple rate of return on the amount invested in the variable annuity and identifies five of the most common misperceptions about the GLWB feature.*

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Introduction

The market crash of 2008-2009 has wreaked havoc on the retirement savings of a vast number of investors. It has also increased interest in the guarantees insurance companies offer on their investment products. In particular, the "living benefit" feature, called the guaranteed lifetime withdrawal benefit (GLWB), offered as a rider on variable annuities is a popular choice for annuity buyers. According to LIMRA, almost 90% of new variable annuities are sold with some form of living benefit rider attached, including accumulation, income, and withdrawal guarantees. Of these, the GLWB makes up two-thirds.

The GLWB provides a guarantee that, regardless of the performance of the investments within the variable annuity, the owner of the contract will receive an annual income for life, usually calculated as a percentage (e.g., 5% per year) of a "benefit base" determined as a fixed annual increase on the initial amount invested. The guarantee is attractive because the investment remains in the market for potential growth, while the benefit base grows simultaneously by the annual increase or "roll-up" rate regardless of actual investment performance. The investor is thus assured of a known amount of income that will be paid for the investor's lifetime, but in no event will the total payments be less than the benefit base.

Many insurers have found it challenging to manage their GLWB rider offerings. Several have suffered significant financial losses due to the exorbitant costs of hedging these guarantees. As a result, most insurers have either reduced benefits and increased fees or withdrawn the GLWB offering outright. These changes apply to newly issued contracts only (although some existing con-

tracts give the company the right to increase fees under certain conditions, which may allow them to increase the fees in future). In addition, even in good economic times, the GLWB is often characterized as too confusing and too expensive. Consequently, many investment advisors shy away from variable annuities with GLWBs.

The popularity of the GLWB proves that it offers an attractive benefit, yet the question that few seem to be equipped to answer is *what is the real value of the GLWB and is it worth the fees?* The answers are not forthcoming because even astute investors and advisors are confused by the various moving parts of a variable annuity with living benefits. In addition, investors are typically unable to place a credible value on the guaranteed income payments. Therefore, discussions about the value of a GLWB have been based more on opinions and impressions than clear analysis.

A great deal of insight can indeed be shed on the value of a GLWB if its mechanism can be easily demonstrated and a credible value placed on the amount of guaranteed lifetime income. Finally, if the overall value can be summarized in terms that the average investor can understand, the impressions of value can be substituted by easily understood facts.

Simple Example of a GLWB

Before we explore the proposed approach, we should look at a simple example of the mechanics of a variable annuity with a GLWB. Table 1 shows an example of a variable annuity that was purchased with $500,000 by a 55-year-old man. The annual fees on the variable annuity are 2.50% and the annual fee for the GLWB is 1.00%. The GLWB has a benefit base that grows at 7% per year (the "roll-up"). This investor is guaranteed a lifetime income of 5% of the benefit base at the time he starts withdrawals. In this example, he will begin making annual withdrawals starting in the 10th year when he is 65 years old. We've assumed annual, level income payouts to keep the example as simple as possible. We've also assumed that the underlying investments grow at an annual rate of 7%.

As depicted in Table 1, the benefit base starts at $500,000 and grows to $983,576. The GLWB benefit base column shows the income benefit base growing at 7% per year. This substantially exceeds the account value, which has grown to $705,299 by the 10th year. Even though the investments are growing at a 7% annual rate, the underlying total annual fees of 3.50% reduce the net annual returns to 3.5%. The annuity account value column shows the cash value growing at a net annual rate of 3.5%. The annual lifetime income benefit in the 10th year is $49,179 (5% of $983,576). The annuity account value at age 66 is arrived at by subtracting the distribution of $49,179 from the age value of $705,299 ($656,120), which then grows at the 3.5% annual rate to become $679,085 at age 66.

In addition, note that the account value has been exhausted by the guaranteed lifetime withdrawals around age 85 in this case. However, the lifetime income continues as long as the investor lives. For example, if the investor were to live to age 100, those annual payments of $49,179 would be paid until age 100.

TABLE 1

Year	Age	GLWB Benefit Base	Annuity Account Value	Lifetime Income Stream
0	55	$500,000	$500,000	
1	56	$535,000	$517,500	$0
2	57	$572,450	$535,613	$0
3	58	$612,522	$554,359	$0
4	59	$655,398	$573,762	$0
5	60	$701,276	$593,843	$0
6	61	$750,365	$614,628	$0
7	62	$802,891	$636,140	$0
8	63	$859,093	$658,405	$0
9	64	$919,230	$681,449	$0
10	65	$983,576	$705,299	$49,179
11	66		$679,085	$49,179
12	67		$651,953	$49,179
13	68		$623,871	$49,179
14	69		$594,806	$49,179
15	70		$564,725	$49,179
16	71		$533,590	$49,179
17	72		$501,366	$49,179
18	73		$468,013	$49,179
19	74		$433,494	$49,179
20	75		$397,766	$49,179
21	76		$360,788	$49,179
22	77		$322,515	$49,179
23	78		$282,903	$49,179
24	79		$241,905	$49,179
25	80		$199,472	$49,179
26	81		$155,553	$49,179
27	82		$110,097	$49,179
28	83		$63,051	$49,179
29	84		$14,357	$49,179
30	85		$0	$49,179

The Real Value of the GLWB

What is the value of the lifetime income payments of $49,179 annually? One approach to establishing this value is to place a cash equivalent valuation on the income stream. In other words, what should a 65-year-old pay in cash for this benefit? We use 65 because the 55-year-old will be 65 in the 10th year when the income stream begins, and it is in the 10th year that we wish to place a cash-equivalent value on the income stream.

In actuarial terms, this benefit is an immediate annuity payable for life but not for less than 20 years. It is also referred to as a "20-year certain & life" (C&L) immediate annuity. This benefit stream is readily valued in the market as almost all insurance companies offer such immediate annuities. For this article, we have used prices from Symetra Financial as of October 16, 2009. In this case, a 20-year C&L immediate annuity issued to a 65-year-old male for $49,179 costs approximately $755,233 in cash. Therefore, when used to provide guaranteed lifetime income starting in the 10th year, this variable annuity transaction is the cash equivalent of investing $500,000 today and receiving $755,233 ten years later. The cash equivalent annual return on the investment (CEROI) is therefore approximately 4.2%. (The CEROI on a benefit not payable in a cash lump sum is the annual rate of return that must be achieved on the investment used to purchase the benefit, in order to grow that investment to the cash-equivalent value of the benefit, over the time period running from the initial investment date to the date benefits are first received.)

Note that the 20-year income benefit by itself reflects an internal rate of return of 2.65% based on the cash-equivalent value. If the annuitant were to live until age 95 (30 years), this rate of return would rise to 5% per year. Note too that these discount rates do not reflect the default risk associated with the issuer of the annuity contract. The CEROI could be appropriately risk adjusted. In this case, the 20-year income benefit could be reduced to reflect the default risk premium (or alternatively a higher discount rate could be used), which would result in a lower cash-equivalent value for the guaranteed income benefits and thus a lower risk-adjusted CEROI.

The CEROI is much less than the roll-up rate on the benefit base (7%). Some readers may be confused by this result. The explanation is quite simple—the benefit base is not a guarantee of a cash lump sum. If the benefit base were available in a cash lump sum instead of a lifetime income stream, the CEROI would indeed be 7%.

Further dramatic insights come to light when we explore the factors that influence CEROI. The primary factors driving the CEROI are:

- The roll-up rate on the GLWB
- The lifetime income benefit payout rate
- The age at which the cash-equivalent annuity is purchased, i.e., age at which withdrawals begin
- The cost of cash-equivalent immediate annuities on the date withdrawals begin
- The underlying investment experience

Table 2 summarizes the CEROI for a 5% roll-up benefit with a 5% lifetime payout for various issue ages (age at which the annuity is purchased) and for various dates on which withdrawals may begin. This table demonstrates the numerical impact of some of the key factors. The lifetime payout amount is based on exact monthly amounts.

There are some immediate conclusions that can be drawn:

- The younger the age at which the GLWB benefit is purchased, the more valuable the guarantee (except, in designs where the roll-up ceases at a particular future date, the CEROI will begin to decline since the benefit base will stop increasing beyond that date and the cash-equivalent value will be lower and further out in the future).
- The sooner withdrawals begin, the less valuable the guarantee.
- Although it is not directly shown, a higher payout rate will result in higher CEROIs (since the monthly income guarantee would be higher).

Table 3 shows a similar analysis but with a 7% roll-up on the benefit base. The conclusions are identical. In addition, the higher roll-up rate results in a higher CEROI. The CEROIs on the later withdrawal start dates would likely be considered attractive by many investors and advisors.

Note that the CEROI of 3.94% in Table 3 is slightly less than the 4.2% calculated based on the example showed in Table 1. This difference is because the examples in Tables 2 and 3 use exact *monthly* payout amounts (paid in advance), while the example in Table 1 assumed *annual* payout amounts (paid in advance) for ease of understanding of the illustration.

The Impact of Interest Rates and Investment Experience on CEROI

The valuation of the cash equivalent immediate annuity is clearly a factor on the CEROI. The cheaper the price of the immediate annuity, the lower is the CEROI. There are two key price drivers for immediate annuities: competition and interest rates. Thus, increased competition for immediate annuities decreases the relative attractiveness of the GLWB. Furthermore, immediate annuities become cheaper as interest rates rise. We are currently in a historically low-interest-rate environment. Even so, Tables 1 and 2 show that the cash equivalents for immediate annuities are substantially less than the benefit base. As rates rise, this discrepancy will increase, making GLWBs relatively less attractive as an investment. The implication is clear: the higher interest rates become, the lower the CEROI. Fixed guaranteed insurance products that potentially offer higher returns may become increasingly more attractive relative to variable annuities with a GLWB.

On the other hand, given sufficiently high returns on the investments underlying the variable annuity, the account value of the variable annuity may exceed the value of the benefit base. In some GLWBs there is also a look-back on the account value, referred to as a "high watermark." In those cases where either the high watermark or the account value exceeds the benefit base at the time withdrawals begin, the higher value is used to calculate the lifetime income guarantee benefit. Thus, for strong upside performance, the CEROI may increase, offsetting the impact of an interest rate increase. It is interesting to note, however, that the appeal of the GLWB is not so much for the upside potential as it is for protection again downside risk.

The Five Biggest Misperceptions of GLWB Value

There are five areas where there may be serious misperceptions regarding the value of the GLWB guarantee. Each of these must be considered and clarified in order to draw informed conclusions regarding the value of the benefit.

TABLE 2

GLWB with 5% Roll-up Paying 5% for Life

Year Income Benefit Starts	GLWB Benefit Base	Monthly Income Guarantee	Issue Age 55 Male		Issue Age 60 Male		Issue Age 65 Male	
			20-year C&L SPIA Valuation	Cash Equivalent ROI	20-year C&L SPIA Valuation	Cash Equivalent ROI	20-year C&L SPIA Valuation	Cash Equivalent ROI
0	$500,000	$2,083.33	$412,189	-17.56%	$392,886	-21.42%	$374,436	-25.11%
5	$638,141	$2,658.92	$501,031	0.04%	$477,512	-0.92%	$458,064	-1.74%
10	$814,447	$3,393.53	$609,065	1.99%	$584,266	1.57%	$567,520	1.27%
15	$1,039,464	$4,331.10	$745,336	2.70%	$723,977	2.50%	$712,652	2.39%

TABLE 3

GLWB with 7% Roll-up Paying 5% for Life

Year Income Benefit Starts	GLWB Benefit Base	Monthly Income Guarantee	Issue Age 55 Male		Issue Age 60 Male		Issue Age 65 Male	
			20-year C&L SPIA Valuation	Cash Equivalent ROI	20-year C&L SPIA Valuation	Cash Equivalent ROI	20-year C&L SPIA Valuation	Cash Equivalent ROI
0	$500,000	$2,083.33	$412,189	**-17.56%**	$392,886	**-21.42%**	$374,436	**-25.11%**
5	$701,276	$2,921.98	$550,601	**1.95%**	$524,755	**0.97%**	$503,383	**0.13%**
10	$983,576	$4,098.23	$735,544	**3.94%**	$705,595	**3.50%**	$685,371	**3.20%**
15	$1,379,516	$5,747.98	$989,166	**4.65%**	$960,820	**4.45%**	$945,790	**4.34%**

The Benefit Base Roll-Up Rate Is a Guaranteed Return on the Underlying Investments

Many have the impression that the roll-up rate on the GLWB is a guaranteed rate on the performance of the underlying investments. Certainly, if the end consumer misinterprets the roll-up rate on the GLWB benefit base to be a floor on investment performance, there may be a strong behavioral motivation to act on such an attractive prospect. However, the analysis of CEROI offered in this article shows this interpretation of the roll-up rate to be false and would be the wrong reason to purchase. The CEROI on the variable annuity with a GLWB can be substantially lower than the roll-up rate on the GLWB benefit base.

A Variable Annuity with GLWB Provides Liquidity and Lifetime Guarantees

Substantial liquidity is provided in the early years of the GLWB, but when withdrawals begin they deplete that liquidity and may deplete it completely. In Table 1, the withdrawals fully deplete the account value in 20 years even with an average annual return of 7% on the investment. If the performance were higher than 7% per year, the point of depletion would have been later. This analysis used only a static return; a Monte Carlo analysis would illustrate the sequence-of-returns risk common to all withdrawal-based approaches. It would demonstrate that the chances of ultimate depletion would be significant.

There is a perception that a variable annuity with a GLWB provides liquidity and a lifetime income guarantee. It would be more accurate to say that the variable annuity with a GLWB provides liquidity or a lifetime guarantee, but likely not both. The liquidity may potentially be depleted if the lifetime guarantee of income is utilized, or the lifetime guarantee may become moot if the liquidity is accessed beyond the guaranteed withdrawal amount.

The Underlying Investments Will Allow the Investor to Keep Up with Inflation

This is often touted as a benefit of a variable annuity with a GLWB. While the investment performance provides the potential to deliver upside, once withdrawals have started, they begin to deplete the account balance. In order to keep the withdrawal guarantee increasing at the pace of inflation, the underlying performance would have to beat the total of base annuity fees, rider fees, and the withdrawal rate by at least the rate of inflation and sustain that performance over long periods of time. This would require underlying investment performance to be consistently sustained at optimistically high levels. For example, in Table 1, investment performance would have to be sustained at 11.5% to keep up with a 3% pace of inflation (i.e. 2.50% base annuity fees, plus 1% rider fee, plus 5% withdrawals, plus 3% inflation).

The Insurance Benefit Begins When Withdrawals Begin

The casual observer may mistakenly conclude that because withdrawals are guaranteed, the insurance benefit begins when the investor begins making withdrawals from the variable annuity with a GLWB. This is completely inaccurate. Withdrawals are funded out of the investor's own account balance and the account balance is reduced by those withdrawals. These amounts are not funded by the insurance company. Instead, the insurance benefit begins at the point in time that the account value is depleted by withdrawals. In the Table 1, this occurs around age 85. But this depletion point could happen earlier, later, or not at all. The fees paid for the benefit are what the insurance company receives in exchange for its guarantee to fund the withdrawal payments *after* the account value is depleted. Astute observers, who understand that the amount and value of insurance payments are conditional on depletion, often cite this fact to support the contention that the benefit is overpriced. However, the biggest driver of the GLWB fee is the cost of hedging the underlying investments to offset the liability incurred at the point of depletion. The point of depletion is highly dependent on market performance. For example, if the underlying annual performance in Table 1 was only 3.5%, the point of depletion would have occurred 10 years earlier at age 75. The additional cost to the insurance company would have been 10 additional years of funding payments, i.e., $491,790.

The Variable Annuity with GLWB Provides a Substantial Legacy for Heirs

This may happen in some upside scenarios; however, it is more likely that the account value will be completely depleted when the GLWB is exercised to consistently withdraw the guaranteed benefit from the account

value of the variable annuity. The biggest factor that influences the likelihood of depletion is the amount of the fee charged for the GLWB benefit. This fee, along with the base annuity fees, is extracted annually from the account value starting on day one. Once withdrawals also begin to be extracted from the account value, the total of withdrawals and fees can be substantial. In Table 1, the withdrawal of $49,179 in the 10th year is 5% of the benefit base but is 7% of the account value. Along with total fees of 3.50%, the effective withdrawal rate in the 10th year is 10.5%! This is not unusual for a variable annuity with a GLWB when the withdrawals are taken. With effective annualized withdrawal rates at these levels, and given the sequence of returns to which these accounts would be exposed, the risk of depletion is quite high. In some cases, insurance carriers charge the GLWB fee on the benefit base, which may result in a higher fee when expressed as a percentage of account value. This further exacerbates the risk of depletion.

Conclusions

With such deep insights into the anatomy of a GLWB, some interesting conclusions can be drawn:

- The GLWB provides an attractive benefit for investors: an income guarantee that protects the investor from the risk of downside market performance. A true measure of the value of the benefit is needed to allow more effective comparisons to alternatives.
- CEROI provides a methodology for measuring the value of a GLWB. This value may be attractive under certain circumstances and is maximized by buying the GLWB as far ahead of retirement as possible and retiring as late as possible, with the length of time between issue and retirement constrained to the longest period over which the roll-up rate on the benefit base is in effect.
- The CEROI, along with other inputs, may allow rank ordering of GLWB benefits, whether these are delivered on a variable annuity platform, a fixed annuity platform, or unbundled. A rank order measure could be easily constructed once the other input measures are identified.
- Higher annual effective roll-up rates provide a higher CEROI to the investor. Higher roll-up rates on variable annuities expose insurers to increased risks, however, and many insurers no longer offer 7% roll-up rates on variable annuity GLWBs. A 5% roll-up rate is more common.
- Investors should consider alternative vehicles that provide guaranteed lifetime income when the GLWB's CEROI is low. For example, where the cash equivalent immediate annuity would be substantially cheaper than the benefit base of the GLWB, a deferred-income annuity could be used to secure the same future income guarantee and potentially leave significant additional assets, which could then be invested for growth devoid of withdrawals. This may result in a larger legacy for heirs.
- A variable annuity with a GLWB appears to have some characteristics that are similar to two-tier annuities—one tier that is not available in cash but only as a lifetime annuity while appearing to have a high guaranteed return on the surface (the benefit base) and another tier available in cash. We highlight this point because two-tier annuities have been common historically in the annuity marketplace and have provided similar challenges to advisors and investors in terms of measuring the value of the products.

The range of CEROI for variable annuities with a GLWB appears to be quite similar to the range of annualized returns typically available on fixed annuities rather than equity investments; it is conceivable that some fixed indexed annuities with GLWB riders may provide similar or better values than some variable annuities with a GLWB in light of the reduced roll-up-rates and higher fees that have recently emerged on GLWBs in the variable annuity market. ■

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