Mesirow

Putting a value on 'Peace of Mind'

A SECURE Act-compliant methodology for quantifying the benefits and costs of Guaranteed Retirement Income products

Abstract

While many provisions of the SECURE Act related to the evaluation of Guaranteed Retirement Income (GRI) products can be satisfied through a qualitative due diligence process, the provisions related to the balance between costs and benefits requires a quantitative assessment. The variety of benefits and costs, as well as the complexity of typical products, presents significant challenges for meeting these specific provisions. This paper proposes an innovative, yet intuitive, evaluation framework. We analyze GRI products based on their individual merits and compare them to retirement income strategies constructed from ordinary investments that a typical investor would use within a defined contribution plan. This framework proposes three novel performance metrics as well as an appropriate *Benchmark Portfolio*. These measures summarize and quantify the downside risk protection benefits of GRI products relative to the *Benchmark Portfolio* in light of the embedded costs.

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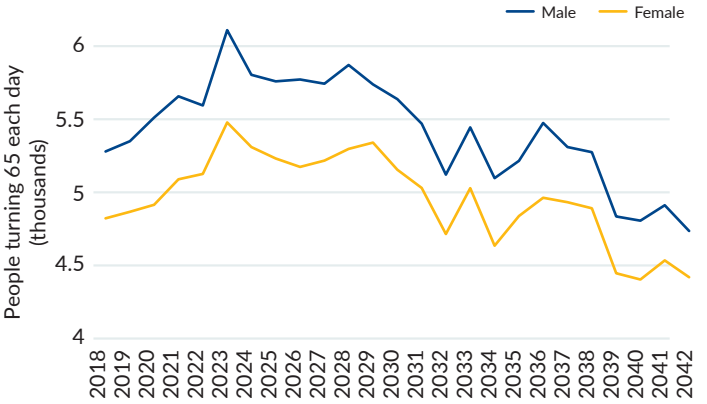
Introduction

As of March 2021, a Google search on the topic of retirement income generates roughly 246 million results. In recent years, there has been a surge of new product development in the area of retirement income strategies. No doubt, the plethora of approaches have arisen to address a sharply growing need and have been further propelled by the passage of the SECURE Act in December 2019. The fundamental need is evidenced by the sheer volume of individuals moving from the accumulation phase of savings to the decumulation phase in coming years.

The very peak of the Baby Boom era was the year 1960 and these individuals will turn 65 in the year 2025. In fact, the number of retirees turning 65 over the next two decades is expected to exceed 10,000 individuals each and every day.[1] Moreover, there is little in the way of established guardrails, aside from simple heuristics around sustainable systematic withdrawal strategies, such as the time-worn 4% Rule, that have been developed to guide individuals in sustainable retirement income strategies.

FIGURE 1: **THE AGING US POPULATION**



Sources: IPUMS-USA, the Human Mortality Database and the Federal Reserve Bank of St. Louis.

A key component of most retirement income strategies is some element that is comprised of guaranteed income. In fact, many holistic approaches are designed around segmenting decumulation spending into fixed and discretionary pools of spending, with concomitant differences in risk levels for related assets to fund those needs. The fixed expense segment is often targeted with guaranteed sources of income of one type or another, which could range from the purchase of traditional out-of-plan annuities to insurance wrappers on balanced portfolios that provide an income floor. In this category, Social Security is often a central plank. Social Security may be the most successful guaranteed retirement income strategy ever created, providing a guaranteed lifetime income floor and benefits that are indexed to cost of living increases. The widespread popularity of the program effectively has made it the "third rail" of American politics, with surveys routinely showing that three quarters of Americans are of the opinion that the benefits should not be reduced in any way and likewise, should be preserved for future generations, even if it means increasing Social Security taxes.[2]

The popularity of Social Security can largely be attributed to one key defining feature—it provides a roughly set amount of income for life. Per the 2019 EBRI/Greenwald Retirement Confidence Survey, 74% of workers and 65% of retirees believe that, with respect to financial priorities in retirement, having a set amount of income for life is more important than maintaining wealth.[3] While workers and retirees continue to see income stability as a key objective, the potential for achieving income stability has become less certain.

The Gallup survey from April of 2019 showed that 57% of retirees view Social Security as their primary source of income, surpassing by far the second and third sources—retirement accounts and pension plans.[4] Moreover, in previous decades, there has been a sharp decline in defined benefit plans, for which investment risks fall on the shoulders of plan sponsors, as these covered only 16% of private industry workers in 2019 according to BLS.[5] In their place have emerged defined contribution plans, for which investment risks fall on the shoulders of workers and retirees. Defined benefit plans obviously provide fixed income, whereas defined contribution plans do not. Furthermore, there is substantial insecurity among Americans regarding Social Security prospects, which is the only remaining guaranteed income provision for many potential retirees. In fact, a majority of non-retired Americans believe that they will not a receive a benefit when they are eligible to receive it.[6]

GRI products have emerged to help bridge this gap between income needs and the traditional sources of income, such as Social Security, and hopefully, increasing the likelihood of meeting overall retirement goals. When used in-plan, most GRI products can also protect retirement account balances near and during retirement. Numerous direct or indirect benefits of annuities in a retirement income context have been posited, including:

- Deferred annuities can help participants save more and defer taxes for a longer period of time. In addition, contribution limits and required minimum distribution requirements may not apply to some annuity products regardless of the income level.
- Annuities can help participants better prepare for retirement by protecting long term savings from market gyrations.
- They can provide risk-averse participants with peace of mind through a life-long source of income.
- Annuities can provide a wide range of options: either a stated rate of return for a specified period of time (fixed annuities) or a variety of investment portfolios with market participation.
- Death benefit features can create a better outcome for designated beneficiaries which would not be available in other retirement products (passing through probate).

Per the research conducted by Georgetown University Center for Retirement Initiatives, in conjunction with WillisTowersWatson (WTW), in 2019, "lifetime income solutions can narrow the distribution of outcomes by directly limiting downside risk for retirees—a critical need in DC plans today."[7]

While anecdotal and perceived benefits of retirement income products abound, there has been an extant gap in methods for quantifying their benefits for the purposes of cost/benefit analysis. This is an obligation of plan sponsors under the SECURE Act. This paper elucidates a rigorous, but intuitive, methodological approach for measuring these benefits relative to the costs.

Review of literature

The Georgetown University and WTW research is a recent example of a quantitative analysis to demonstrate the relative merits of competing strategies designed to meet retirement income needs, with and without annuities. To better understand the range of lifetime income solutions and how they add value, the authors used WTW's Monte Carlo simulation framework, capital market assumptions, and other key inputs such as demographic assumptions for modeling of a "typical" retiree to compare the distribution of outcomes for several alternative strategies. Among the strategies studied were systematic withdrawals, an immediate fixed annuity and a variable annuity with a guaranteed minimum withdrawal benefit (GMWB). Each strategy was analyzed to determine how an initial account balance at retirement would generate and protect annual income, preserve a portion of the initial balance, and impact the probability of running out of money. The authors concluded that lifetime income through annuities could significantly alter the shape of the distribution of outcomes, as well as narrow the distribution by directly limiting downside risk, as noted above.

Earlier seminal research in this area includes a 2013 study by the Stanford Center on Longevity, in conjunction with the Society of Actuaries' (SOA) Committee on Post-Retirement Needs and Risks and using Monte Carlo simulation methodology from The American College.[8] The analysis focused on projecting the annual amounts of inflation-adjusted retirement income and remaining investor wealth in retirement. Among the retirement income generators (RIGs) studied were systematic withdrawals from a balanced 60% equity/40% fixed income portfolio, immediate fixed annuities, and a variable annuity with a GMWB. The forecasted income and wealth remaining varied among the RIGs and across the scenarios, and the authors concluded that there is no "one size fits all" strategy, because of retiree differences in risk tolerance and longevity expectations based on family history and lifestyle, among other factors. However, in analyzing the tradeoffs among the strategies, the study noted that combining annuities with systematic withdrawals could help retirees realize the advantages of individual RIGs while mitigating the disadvantages.

More recent research from the same collaboration in 2016[9] applied their Monte Carlo simulation framework and modern portfolio theory concepts to construct diversified portfolios of RIGs. The analysis studied optimal combinations of RIGs to help retirees strike a balance between different risk/reward goals, translated within the framework into metrics relevant for retirement income. The authors used two types of efficient frontiers to illustrate the tradeoff between 1) expected income and downside risk, as measured by expected income shortfall relative to a benchmark strategy; and 2) expected income and liquidity, as measured by wealth remaining throughout retirement to meet other goals. The study also considered RIGs designed to protect retirement income in the period leading up to retirement, with analysis scenarios modeling the purchases of various annuities at ages 55, 60, or at retirement age 65. The detailed conclusions of the analysis provide many example strategies, combining various annuities with traditional investments and systematic withdrawals, that can help guide participants and their advisors toward a personalized solution based on the best fit for their preferences and circumstances.

While other quantitative analysis approaches exist, including those based on utility models such as Constant Relative Risk Aversion (CRRA) for wealth under various combinations of annuities, Social Security, and systematic withdrawals,[10] the common element among the studies cited above is the use of simulation techniques to answer basic questions about the tradeoffs between costs and benefits for GRI products. We add to this body of work by extending the general framework to arrive at definitive measures of value added by utilizing certain basic assumptions regarding: a savings runway, the establishment of an appropriate *Benchmark Portfolio* and an appropriate probability distribution threshold.

SECURE Act, ERISA Standard and comparison of GRI products

While many provisions of the SECURE Act can be satisfied through a qualitative due diligence process, the provisions related to the balance between costs and benefits requires a quantitative assessment. Specifically, to satisfy ERISA fiduciary obligations under the SECURE Act, the requirements will be deemed to be satisfied if a fiduciary:

- "Considers the cost (including fees and commissions) of the guaranteed retirement income contract offered by the insurer in relation to the benefits and product features of the contract and administrative services to be provided under such contract;" and
- "On the basis of such consideration, concludes that … the relative cost of the selected guaranteed retirement income contract as described [above] is reasonable."

The variety of benefits and costs, as well as the complexity of typical GRI products, presents significant challenges for meeting these provisions. Many GRI products have their own unique features (e.g., the methods for determining the account value and any minimum guaranteed rate features) and these products are unlike traditional investment options available in retirement plans, making it difficult for plan sponsors to establish a due diligence methodology and consistently applying it over time. This is particularly true for sponsors of small retirement plans that have limited resources and cannot hire an outside investment consultant to facilitate the due diligence process. Further, if a plan sponsor wants to select a GRI product for its plan lineup, it typically does not have a choice among GRI products offered by multiple insurers. Instead, its choice is often limited to the GRI product(s) proprietary to the insurer that provides recordkeeping services to the retirement plan. These factors together make it difficult for plan sponsors to conduct the "objective, thorough, and analytical search" and evaluate "features and benefits of the contract and attributes of the insurer in conjunction with the cost" as required under the SECURE Act for fiduciary safe harbor.

While current in-plan GRI products fall into two broad categories—fixed and variable annuities—each has distinct features in several major areas of product design, including the following:

- Purchase of lifetime income.
- Characteristics of account balance during accumulation.
- Characteristics of account balance during distribution.

We believe that the wide variety of product features precludes a comparison of GRI products side by side and drawing any meaningful conclusions regarding their relative merits. Therefore, a peer relative, survey-based comparison of costs and benefits is not generally appropriate.

For this reason, our quantitative evaluation framework analyzes GRI products based on their individual merits and compares their performance to retirement income strategies constructed from ordinary investments that a typical investor would use within a defined contribution plan. The rationale for this approach is the concept that GRI products should be at least as effective at meeting investors' retirement income needs as a portfolio constructed from ordinary investments, but without the associated costs for guaranteed income.

We have developed a Monte Carlo simulation-based retirement income product analysis framework that can assess the balance between the costs and benefits of GRI products. The framework outlined in this paper is designed to accommodate most current in-plan lifetime income product designs, or the combination of a traditional investment strategy and lifetime income products. Examples of the latter include a target date strategy or risk-based portfolios with imbedded lifetime income products. This analytical framework may be used for the following lifetime income products, either on a standalone basis or imbedded within a traditional investment strategy:

- Non-Single Premium Deferred Fixed Annuity/Deferred Income Annuity
- Variable Annuity with GMWB/GLWB
- Immediate Fixed Annuity/SPIA
- Variable Annuity
- Immediate Variable Annuity

This process accommodates immediate annuities when the analysis start age coincides with the age at which retirement begins, because the analysis otherwise requires a financial model of a GRI product during accumulation. For Single Premium products, which include Deferred Income Annuities known as qualified longevity annuity contracts (QLACs), a separate process is required to validate the pricing model for such products. The objective in that case is to confirm that a product's pricing follows industry best practices, and that the implicit costs are reasonable with respect to the benefits.

Methodology

We begin by constructing a detailed financial model of the annuity in a Monte Carlo simulation setting, and accounting for all the necessary ingredients to support a simulation study of the product for participants near and through retirement. This approach is a comparative analysis, in which the GRI product is evaluated on its own (a "stand-alone" analysis), and its performance is judged relative to a benchmark retirement income strategy. The rationale in this regard is that a fiduciary analysis should demonstrate that GRI products perform well relative to strategies constructed from traditional investments, so that all costs and benefits can then be assessed relative to a viable alternative. The analytical process is as follows:

1. CONSTRUCT A 60/40 *BENCHMARK PORTFOLIO* OF TRADITIONAL INVESTMENTS THAT IS COMPARABLE TO THE GRI PRODUCT.

We define "comparable" based on both general risk level (the volatility of the underlying portfolio supporting the guarantees) and lifetime income generating potential. Mesirow has determined that a balanced/moderate-risk level asset allocation portfolio, consisting of equity, fixed income and cash equivalent investments, is an appropriate *Benchmark Portfolio* against which to evaluate GRI products.

Variable Annuity GRI products

For all current in-plan variable annuity GRI products, the underlying investments consist of either target date portfolios, a single balanced/moderate risk asset allocation portfolio, a set of risk-based asset allocation portfolios from which participants can select, or some combination of the above. All are asset allocation portfolios, with the opportunity to achieve a conservative to higher levels of risk, and all such products require systematic withdrawals to produce guaranteed lifetime income.

Because risk drives return potential, which in turn determines the income and wealth generating potential of a strategy, the choice of a typical moderate risk asset allocation portfolio as the benchmark standard for variable GRI products is an intuitive one for variable annuity GRI products. The goal is to compare the potential benefits of the GRI product against a typical portfolio in the absence of lifetime income guarantees.

Fixed Annuity GRI products

Based on risk and return characteristics, a conservative asset allocation portfolio may initially seem to be the appropriate choice of benchmark for fixed annuity GRI products. However, due to its lower income-generating potential, and the requirement of annuitization for guaranteed lifetime income (the partial return of investment principal with each annuity payment, and the continuation of lifetime income even after the principal would have been exhausted), a conservative portfolio is less viable as a benchmark for fixed annuity GRI products. Such a portfolio does not target sufficient investment risk and concomitant return to support competitive levels of income via systematic withdrawals throughout retirement. The selection of a conservative risk level *Benchmark Portfolio* would unfairly favor fixed annuities.

With these dual considerations, we have selected a moderate risk portfolio for all current in-plan fixed and variable annuity GRI products. This corresponds to the assumption that participants are investors of average risk tolerance, so that our study of GRI products can focus on varying the other dimensions relevant for retirement income evaluation.

Fee assumptions

The fee assumptions for the *Benchmark Portfolio* also correspond to those of ordinary investments that offer a real-world viable alternative strategy, but without the GRI product fees associated with the guaranteed benefits. For this purpose, we utilize asset class-level and portfolio-level fee assumptions based on Morningstar category averages for distinct funds available in the underlying asset classes and moderate risk asset allocation strategies. The underlying asset class fees are used to model fund expenses at the asset class level, and a fund-of-funds management fee is applied at the portfolio level so that the total expense of the *Benchmark Portfolio* matches the moderate risk asset allocation category average.

2. STUDY THE *BENCHMARK PORTFOLIO* TO ESTABLISH THE LEVEL OF SYSTEMATIC WITHDRAWALS THAT GENERATE A SUSTAINABLE RETIREMENT INCOME STREAM ADJUSTED FOR INFLATION, ACROSS A RANGE OF PARTICIPANT SCENARIOS BEGINNING NEAR RETIREMENT.

Our analysis calculates a level of sustainable systematic withdrawals at a specific success probability outcome that is deemed conservative and a represents a minimum income threshold that the average investor would like to achieve. The combination of these income streams for different participant scenarios are generated for the *Benchmark Portfolio*. This defines a set of retirement income strategies for comparison to a GRI product. We employ scenarios that look at a 10-year runway beginning at age 55 and retiring at age 65, across a range of longevity expectations and bequest/wealth goals.

Definition of sustainable withdrawals

The withdrawal strategies for a quantitative fiduciary analysis are independent of the GRI product features. The concept of sustainability is defined by establishing a reasonable threshold for ensuring a successful outcome, and by extension, a reasonable level of downside risk. The sustainable income stream is defined to be the one for which both it and the bequest is successfully achieved 85% of the time. This follows a financial industry rule-of-thumb[12], that looks at a set of return outcomes that are roughly one standard deviation below the median outcome across a wide range of simulated potential future capital market outcomes. We evaluate and determine the sustainable income for the *Benchmark Portfolio* at the 85th percentile (-1 Standard Deviation) of success probability.

An investor in that *Benchmark Portfolio* would be expected (based upon the capital market return assumptions) to achieve this income stream or better roughly 85% of the time and achieve a lower outcome roughly 15% of the time. Our methodological assumptions consider this to be conservative level of income stream that we deem to be both sustainable and a minimum income threshold that the average investor would like to achieve. We evaluate the level of success of the *Benchmark Portfolio* and the GRI product to achieve this minimum sustainable income threshold.

Near retirement timeframe

Many GRI products provide age-based incentives for participant contributions during accumulation. In-plan variable annuity GRI products typically begin offering guarantees and charging related fees within 10-15 years of retirement, while some fixed annuity GRI products allow for dollar-cost averaging the purchase of lifetime income across varying interest rate environments throughout accumulation. Evaluating GRI products with the maximum "runway" compatible with their benefit features, the value of which can vary from ten years to all of accumulation depending on product design, could substantially favor the GRI product in a comparative analysis.

Alternatively, assuming the purchase only at the point of retirement, and thereby offering no benefit "runway" at all, would unfairly penalize GRI products in a comparative analysis. The degree to which GRI products require a benefit runway in order to be competitive with the assumed *Benchmark Portfolio* could vary widely.

Our assumption of a 10-year window for initial purchase and ongoing contributions sufficiently balances these considerations within an objective quantitative cost/benefit analysis and is a reasonable baseline.

Range of participant scenarios

Investment planning for accumulation depends on familiar factors such as investor age and retirement horizon. To understand how GRI products fit into a holistic retirement income planning strategy, three additional dimensions must be considered: withdrawal rate (income), longevity expectations, and bequest/wealth goals.

Table 1 illustrates the general impact of each dimension on the allocation to GRI products in an overall retirement income planning strategy.

TABLE 1: DIMENSIONS OF RETIREMENT INCOME PLANNING

Dimension	Value	Relative Allocation to GRI Products
Withdrawal Rate (Income)	Lower	Higher
	Higher	Lower
Longevity Expectations	Above Average	Higher
	Below Average	Lower
Bequest Goal	Lower	Higher
	Higher	Lower

Among these, the impact of longevity expectations on the benefits of GRI products is most obvious: participants who expect to live longer benefit the most from guaranteed lifetime income. Similarly, the lower the need for terminal wealth remaining at life expectancy (i.e. bequest/wealth goal), the more room there is to purchase lifetime income.

Generally, the smaller the gap between the withdrawal rate and the income produced by a GRI product, the less likely the accumulated value generated by traditional investments is required to meet the income need. Interestingly, the greater the competing income needs and wealth goals that a retirement income portfolio is required to produce, the more valuable guarantees can become. Placing a greater requirement on a retirement income portfolio both to produce substantial income and fulfill higher bequest/wealth goals can surprisingly lead to greater preference for GRI products.

GRI products should demonstrate their value on average across participant circumstances that vary along these dimensions of retirement income planning. For example, if a participant has an above-average longevity expectation and desires a significant bequest/wealth goal, the sustainable income stream is determined over a timeframe exceeding normal life expectancy, and accounts for the desire to have the terminal wealth remaining to meet or exceed the bequest/wealth goal at the end.

We utilize the *Benchmark Portfolio* to determine a required income stream, adjusted for inflation, for varying levels of participant longevity and bequest/wealth goals to define a set of viable retirement income strategies that can be fairly compared to the GRI product.

3. EVALUATE THE GRI PRODUCT UNDER THE SAME WITHDRAWAL AND PARTICIPANT SCENARIOS AS THE *BENCHMARK PORTFOLIO*.

The combination of the *Benchmark Portfolio*, the sustainable income stream, and the time frames and wealth goals associated with each longevity and bequest level produces a set of retirement income strategies, which can be achieved with traditional investments. The calibration point for comparison is achieving that sustainable income stream at the conservative 85th percentile success probability, which we determine to be a conservative minimum required sustainable income stream.

The analysis then determines under the array of identical scenarios how an alternative GRI product does in meeting that same minimum sustainable income stream. This approach incorporates both the direct and indirect costs for the GRI product relative to the benefits. By accounting for any income shortfalls and re-investing any excess income from GRI products, it is possible to perform an apples-to-apples comparison of GRI products to the *Benchmark Portfolio* in achieving the same set of viable retirement income strategies. It should be noted that the balance of reinvested excess income in the analysis of a fixed annuity product can be used to meet bequest goals, so that including bequest in our analysis does not unfairly penalize such products.

4. AGGREGATE PERFORMANCE METRICS ACROSS SCENARIOS FOR COMPOSITE SCORING OF THE GRI PRODUCT VS. *BENCHMARK PORTFOLIO*.

To analyze the performance of the GRI product relative to the *Benchmark Portfolio*, we define performance metrics relevant for retirement income and aggregate the results into composite scores.

Retirement income performance metrics

This framework uses three performance metrics for quantitative comparison of the GRI product and the *Benchmark Portfolio*. These measures effectively capture the downside risk protection of GRI products relative to the *Benchmark Portfolio* in light of the embedded costs.

- **Retirement Income (RI) Score.** This proprietary metric is a statistic designed to measure the effectiveness of a strategy in generating income while preserving wealth for bequest goals. It is founded on the concept of internal rate of return, rather than the usual time-weighted geometric return, as the most relevant measure of strategy performance when studying retirement income.

Our subcomponent terms are defined as follows, assuming that withdrawals have not depleted the portfolio value after withdrawals have begun within a general investment strategy:

- $RISM^{W}(t)$: Wealth Component of Retirement Income Success Metric at Year t. The dollar-weighted, cumulative capital appreciation return of a strategy. A positive dollar value equivalent to the portfolio wealth remaining t years after income payments have begun. In other words, the value of remaining portfolio wealth at Year t.
- $RISM^{I}(t)$: Income Component of Retirement Income Success Metric at Year t. The dollar-weighted, cumulative income return of a strategy. A positive dollar value equivalent to the future value of the portion of initial portfolio wealth required to exactly generate t years of income payments, with the realized IRR of the Income Component as the return used to calculate future value. In other words, the future value of an annuity purchased today that exactly meets all future income payments through t years.

In the real world, the unpredictability of market returns prevents us from knowing the outcome of a retirement income strategy *a priori*. However, with the initial portfolio wealth, required income payments, and an investment horizon T for the strategy specified, the realized market return on the strategy from year to year remains the only unknown in determining its detailed outcome. This market return depends on both the asset allocation policy and returns of the underlying asset classes, but only the realized return on the full portfolio matters for the overall performance of the strategy.

For this reason, we can specify a target portfolio return, R_{TGT}, and calculate the full deterministic history of a strategy assuming that the realized market return always equals the target portfolio return. The choice of target return determines the final portfolio wealth, because all other strategy details are already specified. Alternatively, we can specify a target portfolio wealth $W_{TGT}(T)$, at the strategy investment horizon T, which allows us to calculate an implied target portfolio return R_{TGT}. Because wealth/bequest goals are specified in our analysis, we take the latter approach to calculate the target portfolio return R_{TGT} that exactly satisfies the combined income and wealth preservation goals of the strategy.

Using the target portfolio return R_{TGT} in place of both realized market return and IRR, we establish a strategy benchmark to which we can compare the realized strategy performance for any year up until the strategy investment horizon T, by calculating target *RISM* values for the income and wealth components of the *RISM*. Such target *RISM* components indicate whether the strategy is on track to meet both long-term income and capital preservation goals.

At the strategy investment horizon T, they are defined as follows:

- $TRISM^{W}(T)$: Wealth Component of Target Retirement Income Success Metric at Year T. The dollar-weighted, cumulative capital appreciation return of a strategy, assuming it successfully meets the all income and wealth preservation goals 100% of the time. Equal to $RISM^{W}(T)$, calculated assuming the realized market return on the strategy portfolio is the Target Portfolio Return R_{TGT}, for all years prior to the strategy investment horizon T.
- $TRISM^{I}(T)$: Income Component of Target Retirement Income Success Metric at Year T. The dollar-weighted, cumulative income return of a strategy, assuming it successfully meets all income and wealth preservation goals 100% of the time. Equal to $RISM^{I}(T)$, calculated assuming the realized IRR on the strategy portfolio is the target portfolio return, R_{TGT}, for all years prior to the strategy investment horizon.

For each Monte Carlo simulation outcome of a retirement income strategy with investment horizon T, we take the differences $[RISM^{W}(T) - TRISM^{W}(T)]$ and $[RISM^{I}(T) - TRISM^{I}(T)]$ to quantify the degree to which the wealth and income components remain on target, respectively, on a cumulative basis and in dollar terms. These provide separate measures of the effectiveness of the strategy in generating income payments up to the strategy investment horizon, while preserving portfolio wealth to meet any wealth/bequest goals. To convert these quantities to cumulative return factors, we divide by a normalization factor: *Total Initial Wealth*, defined as the dollar amount of the initial account value at the analysis start age, plus the present value of remaining participant contributions prior to retirement.

To measure the overall success of a retirement income strategy, we equally weight the two components $RI\ Score^{W}(T)$ and $RI\ Score^{I}(T)$, the cumulative wealth and income return factors at the strategy investment horizon T for each simulation outcome, respectively. We then annualize the result for each simulation outcome and average across all simulation outcomes to calculate the RI Score.

- **Risk-adjusted RI Score.** The risk-adjusted Retirement Income Score is a proprietary metric defined as the ratio of the Retirement Income Score to its standard deviation derived from the full set of simulation outcomes.
- **Average shortfall.** This proprietary metric is the probability weighted present value of the retirement stream outcomes that fail to meet the *Benchmark Portfolio* sustainable income stream and the bequest goal. For the *Benchmark Portfolio*, it is calibrated such that 15% of the outcomes will fail to meet this designated income stream and the bequest. The average shortfall represents the probability weighted shortfall in present value dollar terms. It generates an intuitive dollar value of the potential downside risk protection when compared to the *Benchmark Portfolio*.

Comparison with industry and academic retirement income methodology

As in the Georgetown/WTW study, we use capital market assumptions and other key inputs and assumptions, such an average participant accumulation phase income and contribution model, based on Employee Benefits Research Institute (EBRI) and other broad participant demographic data. Our analysis also studies how an initial account balance and contributions would generate and protect annual income, preserve a portion of the initial balance through the wealth/bequest goals, and we factor in the probability of running out of money by solving for a sustainable withdrawal rate.

Common features with the Stanford/SOA/American College collaboration methodology include recognition of longevity expectations as a key consideration, the use of a balanced/moderate-risk asset allocation portfolio with systematic withdrawals as a competing retirement income strategy, and

analysis scenarios starting near retirement to capture the benefits of annuities designed to protect retirement income in the period leading up to retirement.

The application of the Stanford/SOA/American College collaboration analysis framework to optimize diversified portfolios of annuities and traditional investments led to their development of metrics to gauge strategy performance and risk that are relevant for retirement income. Specifically, they studied the tradeoff between expected income generation and downside risk, as measured by expected income shortfall relative to a benchmark strategy (an inflation-adjusted SPIA), and liquidity, as measured by wealth remaining throughout retirement to meet other goals.

We also analyze downside risk, but the details and the depth of our analysis are the key differentiators in our approach. Rather than a general comparison of probability distributions, we utilize a *Benchmark Portfolio* and a specific percentile probability (- 1 SD), in order to arrive at an objective value estimation of the benefits. This makes our methodology uniquely powerful for the study of GRI products.

Traditional simulation methods provide success and risk measures such as average portfolio wealth and probability of shortfall at a particular horizon. Such traditional simulation methods account for the frequency of failure (i.e., probability of shortfall) for a strategy, but not of the degree of failure. Our method provides both the frequency and the severity of shortfall, in the form of a dollar shortfall for each simulation outcome, at any horizon. Thus, it allows us to quantify the downside risk protection of a GRI strategy in intuitive dollar terms.

Results

The results in Table 2 represent the three performance metrics analyzed for a generic GLWB product relative to the *Benchmark Portfolio*. Results are shown for even years from 2012 through 2020 to encapsulate different yield curve and product pricing environments. While this analysis may be applied to the array of products highlighted earlier, we have selected the analytical output for a generic GLWB product as representative of the process and typical results.

Higher scores represent a superior ability to generate retirement income and bequest goals on average relative to the benchmark sustainable income stream. When looking at the worst 15% of return outcomes, there will be shortfall outcomes by definition. The goal of the protection embedded in the GRI product is to improve these outcomes on the downside when they do occur. The difference in the present value of this Average Shortfall metric is an intuitive dollar value measure of that benefit. The graphical display of the cumulative distributions for the *Benchmark Portfolio* and the GRI product for one of the analysis scenarios is shown in Figure 2.

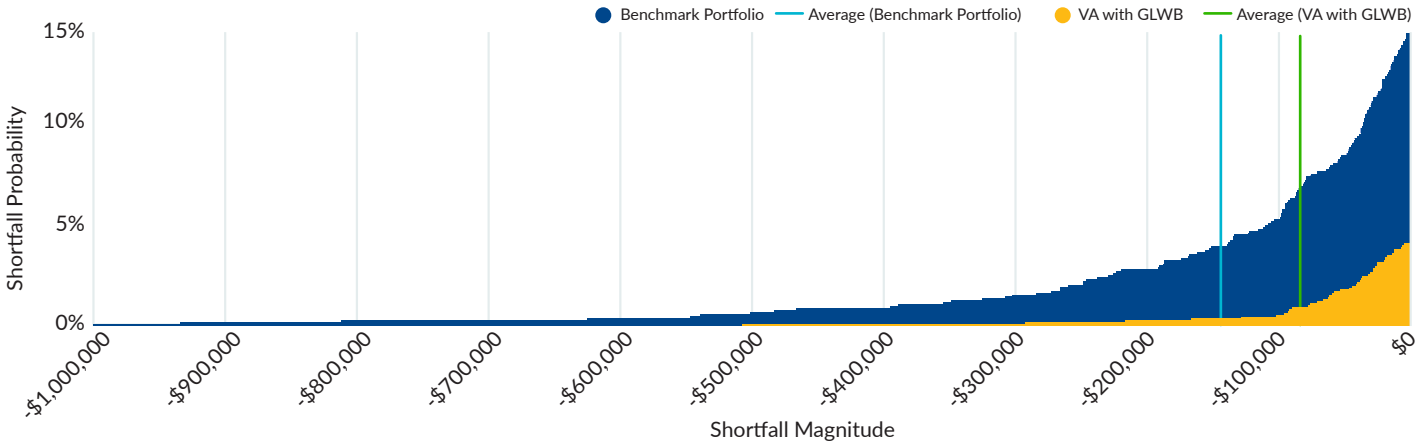
While the other two measures may not be as intuitive and may lack a frame of reference for scale, these metrics have the balance of measuring the entire array of outcomes in the probability distribution of returns, rather than just the downside.

TABLE 2: SUMMARY RESULTS OF SCORE METRICS

Analysis	Metric	Benchmark	Generic GLWB Product	Difference
2020 10-Year Runway	RI Score	1.64%	2.56%	0.92%
	Risk-Adj RI Score	0.134	1.325	1.191
	Average Shortfall	-$129,655	-$78,483	$51,173
2018 10-Year Runway	RI Score	1.56%	2.48%	0.92%
	Risk-Adj RI Score	0.131	1.238	1.107
	Average Shortfall	-$169,038	-$83,207	$85,831
2016 10-Year Runway	RI Score	0.51%	2.24%	1.73%
	Risk-Adj RI Score	0.028	1.034	1.006
	Average Shortfall	-$174,151	-$84,577	$89,574
2014 10-Year Runway	RI Score	1.34%	2.38%	1.04%
	Risk-Adj RI Score	0.103	1.118	1.015
	Average Shortfall	-$162,652	-$90,591	$72,061
2012 10-Year Runway	RI Score	0.40%	2.11%	1.71%
	Risk-Adj RI Score	0.025	0.979	0.953
	Average Shortfall	-$160,724	-$92,883	$67,841

Source: Mesirow. Past performance is not indicative of future results.

FIGURE 2: **SHORTFALL DISTRIBUTIONS**



Source: Mesirow

Conclusion

The ERISA standard under the SECURE Act presents several challenges when selecting GRI products. Among the most formidable is the assessment of the balance between costs and benefits for participants in a defined contribution setting. We have presented the principles behind the fiduciary analysis process, outlined the steps of the process, and a provided a high-level overview of the quantitative analytical framework. Our analysis captures the impact of changing financial markets on the performance of GRI products, both for accumulation investing and across a variety of participant scenarios in retirement, and in doing so allows us to assess the balance between costs and benefits for all current in-plan product designs.

One key innovation of the methodology presented here is the construction of separate performance metrics for the efficacy of the realized income and portfolio wealth of a *Benchmark Portfolio* investment strategy, which in turn provides an attribution of the GRI product's relative performance into both income generation and wealth preservation components. The second innovation of this approach is a direct measure of a strategy's downside risk benefits.

Traditional simulation methods provide measures of strategy performance and risk based on averages of simulation outcomes. Alternatively, they focus on median, favorable, and unfavorable scenarios that are slices from the distribution of simulation outcomes. The usual metrics include forecasted income, wealth remaining, and the probability of success, or the shortfall, which is defined as the failure to meet or exceed both income and wealth preservation goals (a.k.a. "running out of money").

The common element of these traditional simulation methods is that their story ends when a particular outcome leads to shortfall. Our approach looks beyond the point that is inaccessible through traditional simulation methods, in order to extract quantitative details of strategy underperformance. In other words, we can see beyond the retirement income "event horizon"—the point of no return after running out of money—and provide the summary results for fiduciary analysis.

Finally, our methodology is able to quantify the downside risk of a strategy based entirely on the strategy's ability to meet all income and wealth goals for each simulation outcome. Traditional simulation methods provide the frequency of failure (the probability of shortfall) for a strategy, but not of the degree of failure. Our methodology provides both the frequency and the severity of shortfall, at any horizon, and it thereby allows us to quantify the relative superiority of a competing strategy in intuitive dollar terms.

About Mesirow

Mesirow is an independent, employee-owned financial services firm founded in 1937. Headquartered in Chicago, with locations around the world, we serve clients through a personal, custom approach to reaching financial goals and acting as a force for social good. With capabilities spanning Global Investment Management, Capital Markets & Investment Banking, and Advisory Services, we invest in what matters: our clients, our communities and our culture.

Mesirow Fiduciary Solutions helps the retirement plan community achieve their intended investment objectives through our institutional 3(21) and 3(38) Fiduciary Partnership Services, fiduciary technology and reporting, and customized default solutions.

To learn more, visit mesirow.com or email us at fiduciaryinquiries@mesirow.com.

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Neither principal nor the underlying assets of target date investments are guaranteed at any time, including the target date, and investment risk remains at all time. There is no assurance that the recommended asset allocation will either maximize returns or minimize risk or be the appropriate allocation in all circumstances for every investor with a particular time horizon.

As described in this guide, each GRI product has its own unique features. The amount that may be paid under a GRI product may be impacted by a number of different factors including, the GRI's contract provisions and the claims paying ability of the product's insurer.