

Income is the outcome



A review of lifetime income solutions

Russell Investments Research



Defined contribution (DC) plans are both popular and predominant; however, when measured by the defined benefit (DB) yardstick of generating lifetime income, they haven't yet proven to be successful. The sole focus of DC plans has historically been to accumulate assets during the working years, with little support provided to participants in retirement. A common analogy is the airplane pilot parachuting out of the plane just before reaching your destination, leaving you to maneuver the landing on your own. The "landing gear" of our DC system are solutions designed to help participants convert their accumulated retirement balances into lifetime income. This paper provides a review of product types available to do so.

New rules

In our 2015 paper on the topic of lifetime income, titled "DC Retirement Income Solutions," we described lifetime income as being very much in the "talk" stage. While still in the "talk" stage today, the talk seems different now. It's happening at plan sponsors' investment committee meetings, rather than just at industry conferences, often in conjunction with broader committee conversations about asset retention and workforce planning.

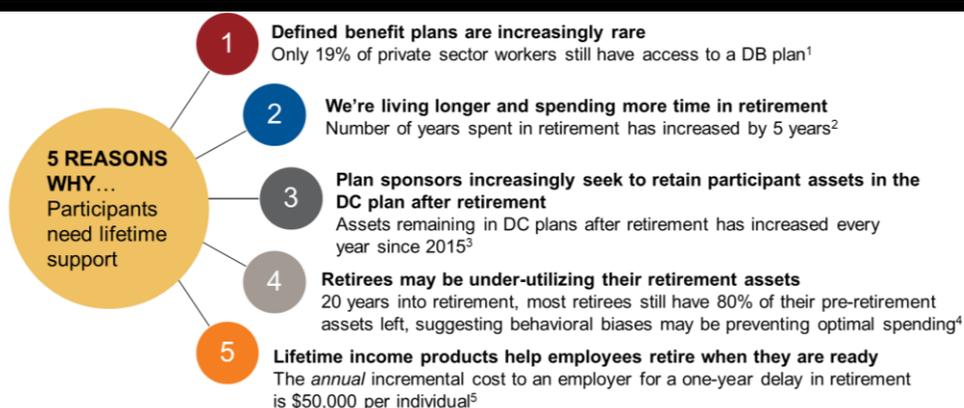
The SECURE Act passed in December 2019 was the flashpoint. It provided a new fiduciary safe harbor for selecting an insurance provider as a distribution option and made mandatory inclusion of lifetime income projections on participant statements a reality. We anticipate the SECURE Act will be a catalyst for more organizations evaluating, and eventually adopting, lifetime income for their DC plans.¹ Still, the notion of finding a single income solution that checks the box for all plan participants isn't realistic for many plan sponsors.

Systemic factors also stoke the winds of change. The transition from a DB to DC retirement system has shifted several risks from employer to employee. These include contribution risk, behavioral risk and, inescapably, longevity risk. An aging working population also creates an impetus to seek solutions that help manage the high cost of employees not being able to retire "on time."

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¹ DC Steering Committee at Russell Investments and O3 Plan Advisory Services, The SECURE Act affects your retirement plans. Here are 7 key implications for employers, 2019.

Exhibit 1: Five systemic forces behind the need for lifetime income solutions



Source: 1. Employee Benefits Research Institute (EBRI) Databook; 2. Since 1940 life expectancy of those who reach 65 has increased by five years. Social Security Administration – Life Expectancy for Social Security <https://www.ssa.gov/history/lifeexpect.html>; 3. T. Rowe Price. Percent of DC assets remaining in defined contribution (DC) plans 1 year after separating from service; 4. Spending retirement assets...or not? BlackRock Retirement Institute; 5. Prudential Insurance Company, "Why Employers Should Care About the Cost of Delayed Retirements."

Providing a more certain benefit to employees in retirement is within reach. We encourage plan sponsors to take a multi-faceted approach to helping participants secure income in retirement. This is because participant needs are highly personal, especially in retirement, when everyone is funding toward different objectives. Fortunately, there is a multitude of products designed to help participants generate lifetime income. This paper reviews the product categories available in the marketplace today on several key dimensions, and the types of participants for whom they may be most applicable. With retirement income support, retirees can sit back, relax and enjoy the milestone of retirement knowing a smooth journey lies ahead.

A range of solutions for a range of participants

Retirees consistently express three primary needs concerning their assets in retirement. The first is sustainability—the risk of outliving their assets. The second is predictability—consistent income. The third is financial flexibility—liquidity.² We refer to the three retiree needs—sustainability, predictability and flexibility—throughout the paper, because these individual needs, in addition to preferences about income level and portfolio volatility, affect participants' lifetime income decisions. The degree of value assigned to each of these distinct needs will inform the type of retirement income solution that best matches each person's unique needs and circumstances. Eventually, we believe consideration of these preference will be used to determine the ideal allocation between investments and insurance products for each individual.

Today, many DC plans will be best served by addressing participants' retirement income needs with a range of solutions designed to address the differing needs and preferences of participants nearing retirement. Most of today's retirees rely on Social Security as their primary retirement benefit. It provides a floor, but few can expect it to be enough to sustain their pre-retirement standard of living. As illustrated in Exhibit 2, the level of income needed to provide typical income replacement in retirement varies widely among individuals.

- A person earning a \$50,000 salary could expect to receive about \$22,000 from Social Security after a full working career. That leaves an annual funding gap of \$22,250 that must be filled by income generated from retirement assets and personal savings. This person needs \$402,500 in total savings by age 65 to make up the funding shortfall, yet the average 401(k) balance for this person at age 65 is only \$116,745³ and additional savings are typically minimal.

² Russell Investments, Sam Pittman, Rod Greenshields (2012) Adaptive Investing: A responsive approach to managing retirement assets.

³ Ascensus, Inside America's Savings Plans, 2020.

- A person earning a \$100,000 salary should expect to receive about \$32,000 from Social Security after a full working career. That leaves an annual funding gap of \$57,100 that needs to be filled by income generated from retirement assets and personal savings. This person needs \$1,048,200 in total savings to make up the shortfall, yet the average 401(k) balance for this person at age 65 is only \$414,412.⁴

Exhibit 2: Level of income needed to maintain standard of living in retirement

SALARY	ANNUAL INCOME NEEDED IN RETIREMENT	INCOME EXPECTED FROM SOCIAL SECURITY	FUNDING GAP	RETIREMENT ACCOUNT BALANCE NEEDED TO CLOSE FUNDING GAP
\$25,000	\$21,700	\$14,280	\$7,420	\$136,000
\$50,000	\$44,200	\$22,250	\$21,950	\$402,500
\$75,000	\$66,900	\$28,700	\$38,200	\$703,000
\$100,000	\$89,500	\$32,400	\$57,100	\$1,048,200

Source: Russell Investments. Future income projections are expressed in future retirement year's dollars.

The picture becomes even more varied when accounting for the fact that retirement planning is often a household decision-making process with multiple individuals contributing⁵. Therefore, perspectives about employees' retirement readiness obtained by analyzing employee demographic data cannot necessarily be taken at face value because the complete household picture is unknown. Solving for one and all is difficult when variables outside the plan are unavailable. Fortunately, we don't need to. The growing range of available lifetime income options is sufficiently varied to balance the individual needs of employees. Much like the diverse, but streamlined, set of investment options many DC plans are now gravitating toward on the accumulation side, a simple and intuitive set of decumulation options that support different types of participants in their transition from saving to income generation is ideal.

A page from the accumulation playbook

It's unlikely the retirement income marketplace will mature into a universal, one-size-fits-most solution like traditional target-date funds. That's because the retirement spend-down complexion of every person is different. A spectrum of investment options for the spend-down phase, which has long been the construct for the accumulation phase, can help retirees in all situations put together the pieces to create an income stream tailored to their specific circumstance regarding benefits package, outside assets, Social Security, required minimum distributions and other household assets and income.

A curated spectrum of decumulation options may eventually win out as the preferred approach to implementing lifetime income in DC plans. However, as the saying goes, if you don't start somewhere, you won't get anywhere; so, where should a DC plan sponsor start? Acknowledging the capacity of plan fiduciaries to select and monitor investment options is far from unlimited, balancing participant choice with plan menu simplicity is key to avoiding unnecessary complexity for the participant and plan sponsor alike.

A logical starting point is a qualified default investment alternative (QDIA) with a guaranteed payout option, along with a managed account that includes a payout provision. This provides lifetime income bookends for the employees in the plan that want to take their hands off the

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⁴ Ascensus, Inside America's Savings Plans, 2020.

⁵ RAND Center for the Study of Aging, Katherine Grace Carman, Angela A. Hung (2017) Household Retirement Saving: The Location of Savings Between Spouses.

wheel and receive professional guidance on asset allocation and annuity purchase decisions. Additional lifetime income options could be added to fill in the spectrum as demand increases, and those who are not “one size fits all” could opt out of the default and choose an alternative.

Without including a lifetime income option in the default, participant demand and adoption could remain low, even with a well-designed, post-retirement income menu. “We offer it, but no one uses it” is an all too common refrain from DC plan sponsors. Don’t be discouraged by initial low utilization. The participant will certainly need to be brought along. Re-framing the focus of the DC plan from savings to income generation is an important starting point. The newly required lifetime income illustrations will be instrumental in changing the mindset and should lead to greater demand for solutions that help participants actualize the projected income stream they see on their statements. It’s a good idea to set expectations with internal stakeholders. They must understand that employees’ needs for lifetime income is a process requiring sustained participant education and communication.

We believe the historical framing of the drawdown decision as being an all or nothing choice between a guaranteed solution (i.e. annuity) or a non-guaranteed solution (i.e., non-annuity) has contributed to the lack of adoption. If only one or the other is offered, what about the participants for whom the solution doesn’t meet their needs and preferences? Do they attempt to design a different solution themselves? Do they leave the plan for other alternatives? Participants will be more successful navigating these decisions if they’re not constrained by a binary choice to either do or not do something (i.e. annuitize or not annuitize). Ultimately, for the greater number of participants that chose to self-manage their assets in retirement, the ability to select from a range of income options, framed in a way that illustrates the trade-offs and decision factors, will likely lead to a greater understanding and utilization. The good news is, many plan sponsors have already constructed a foundation to build upon, by providing participant education, advice and financial planning tools and access to income generating solutions like stable value and annuities as a distribution option.

With so many options available in the marketplace, how will a plan sponsor choose? Referring to the three primary financial needs of retirees—sustainability, predictability, and flexibility—we can design a streamlined array of post-retirement solutions that broadly maps to these different financial needs. A useful starting point is creating a framework to align the different types of lifetime income solutions to high-level participant needs and preferences.

Overview of lifetime income product categories

In our previous paper on lifetime income solutions, we compared three lifetime income product categories: fixed deferred annuities, guaranteed lifetime withdrawal benefits (GLWB) and self-managed withdrawals. Today, there are a few more. Exhibit 3 briefly describes the various types of lifetime income product categories generally available in the marketplace today and provides a qualitative assessment of the directional indicators of success for each product category.

All these product categories are included in our analysis except managed accounts with a payout component, because of the individualized nature of that solution. A more detailed description of the product types is contained in the Appendix.



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Exhibit 3: Alignment of lifetime income products with metrics of success

		Insurance product (may be optional)					
	DESCRIPTION	LEVEL OF INCOME	SUSTAINABILITY	PREDICTABILITY	FLEXIBILITY/ LIQUIDITY	RESIDUAL BALANCE	EXPLICIT COSTS
Self-managed withdrawal	Self-driven withdrawals over time						None
Managed payout fund	Provides income based on market performance						Medium
Income-oriented bond fund	Portfolio of fixed income securities with high income potential						Medium
Target maturity bond fund	Portfolio of fixed income securities with a series of pre-determined maturity dates						Low
Target date fund with guaranteed income	TDF that allocates to annuities over time with the option to annuitize in the future						Low
Guaranteed lifetime withdrawal benefit (GLWB)	Balanced portfolio with variable annuity provides income regardless of market returns						High
Immediate annuity	Insurance product that provides guaranteed income in exchange for an upfront cost						Not applicable

Source: Russell Investments

Quantitative comparison of lifetime income strategies

This section provides a quantitative comparison of the lifetime income product categories available today. Analysis of lifetime income solutions is multi-layered. The available solutions differ on several dimensions, making them difficult to compare. The intent of our analysis was not to crown any single solution “the winner,” because none will be better than the rest on all metrics, and the comparative results on any single factor will not tell a complete story.

Rather, the goal was to present the analysis in a way that lines up strategies holistically and provides directional indicators for success against certain participant decision factors, supported by both qualitative and quantitative analysis.

We reviewed various lifetime income product categories available today across multiple retirement outcomes including:

1. Monthly/annual spending
2. Cumulative spending
3. Sustainable withdrawal rate
4. Probability of exhausting assets at various withdrawal rates
5. Remainder balance (bequest to heirs)

We also reviewed three capital market performance scenarios⁶.

1. Weak markets
2. Normal markets
3. Strong markets

⁶ Source: Russell Investments strategic forecast scenarios as of December 31, 2019. Changes in interest rates impact the income amount from guaranteed products and the market value of assets. Weak/Normal/Strong markets represent the 10th/50th/90th percentile of forecasted market scenarios respectively.

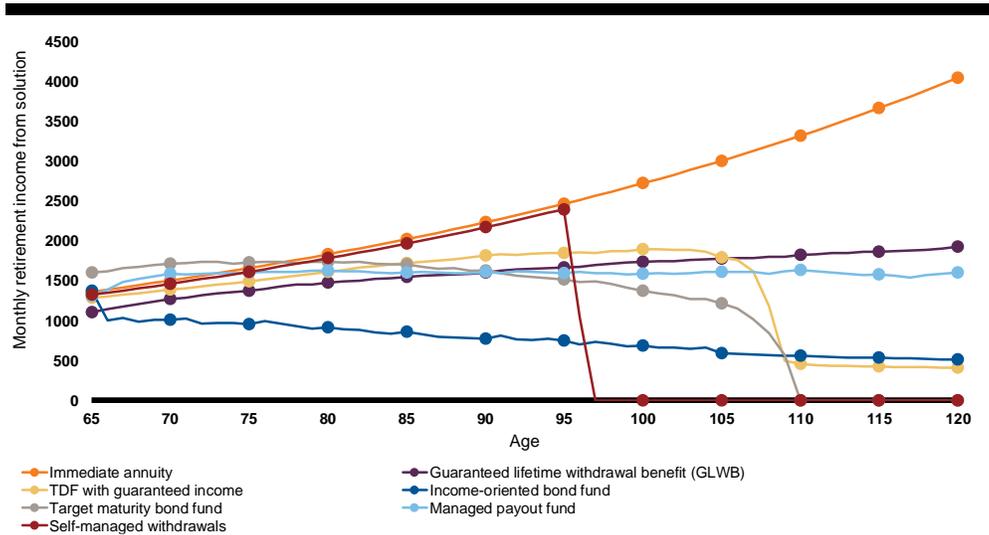
To compare the lifetime income product categories, we assume the same 55-year-old participant with a \$60,000 salary and \$150,000 current account balance invests in each one of the products and makes contributions of 14% until retirement at age 65 (10% of salary, plus 4% match from employer).

For this paper, our intent was to analyze existing lifetime income solutions that can be incorporated in a DC plan today. The illustrative comparisons that follow are based on actual products currently available in the marketplace. Wherever possible, we used actual asset allocations, income payout rates and investment management fees. When this information was not specified or available, reasonable assumptions were made. For this reason, we chose not to make the assumed income payout percentage equivalent for all of the product categories. Rather, we used the actual payout rates embedded in the representative products to avoid hypothetical scenarios that cannot be obtained in the lifetime income product set offered today. Of course, if a participant wishes to receive more/less income than a particular product is designed to deliver, they could allocate to a lifetime income product in combination with other investments to achieve their desired spending goal. Additional details about how these product categories were modeled and the assumptions used are included in the Appendix.

Additional qualitative factors were considered, such as liquidity, flexibility and utilization potential. Analysis of lifetime income solutions is multi-layered so a direct comparison of product archetypes on any single metric will not tell a complete story. As such, we use both qualitative and quantitative analysis to peel back the layers to reveal to what degree different solutions meet participant needs using illustrative comparisons. We caution the reader against inferring that a single solution is superior to all the rest based on a single metric.

In Exhibit 4, we begin with what we believe is a critical aspect of this analysis from a plan participant's perspective: The expected monthly income from each product category and how long it is expected to last.

Exhibit 4: Monthly payout expected



Source: Russell Investments

Under normal market conditions, all solutions have a high probability of providing sustainable income for the duration of retirement, albeit at vastly different levels. Later, in Exhibit 7, we will observe that the product categories that appear lower on this metric of annual income, generally display higher results on the metric of remaining account balance at the end of life, particularly in weak market conditions. The immediate annuity stands out as delivering an income stream that is more generous than with other solutions, because the participant is exchanging all of the retirement assets for that income stream. The self-managed withdrawal strategy supports about the same monthly spending as the annuity, until age 95 when the participant abruptly “runs out” of money. In weak markets, this occurs at age 86. Self-managed withdrawals assume the participant strictly adheres to the spending plan of a 4.5% annual

withdrawal rate with a 2% annual cost of living adjustment⁷, which is rarely the case. The typical participant has great difficulty executing this path because of the uncertainties related to life and financial markets combined with the challenge of prioritizing different financial goals in retirement.

Greater divergence between the solutions is observed after the age of 80 when the impacts of inflation on the level of income generated over time are readily observed. Monthly income increases over time for solutions that are assumed to have a cost-of-living inflation adjustment, which in this analysis were the immediate annuity and the self-managed withdrawal strategy. However, the COLA feature comes with the trade-off of a lower initial income amount. Income remains relatively stable for solutions that maintain meaningful allocation to growth assets, which are the GLWB, the Target Date Fund with Guaranteed Income and the Managed Payout Fund, as the equity component generally provides returns above inflation over the long-term. However, in weak market conditions the annual income amount stagnates, and inflation may erode purchasing power. Income declines over time with inflation for the bond-based Dividend Income Fund. Not so with the Target Maturity Bond Fund because it only requires a small portion of the participant's assets to be invested in the bond-based product during the early retirement years, and the rest is assumed to remain in the target date fund glidepath. Thus, inflation impact is greatest after 20+ years of retirement when the overall asset allocation becomes more highly tilted to fixed income.

To normalize the fact that the level of monthly income fluctuates to varying degrees over time, and that different products have different embedded or assumed withdrawal rates, we also compared cumulative income over time.

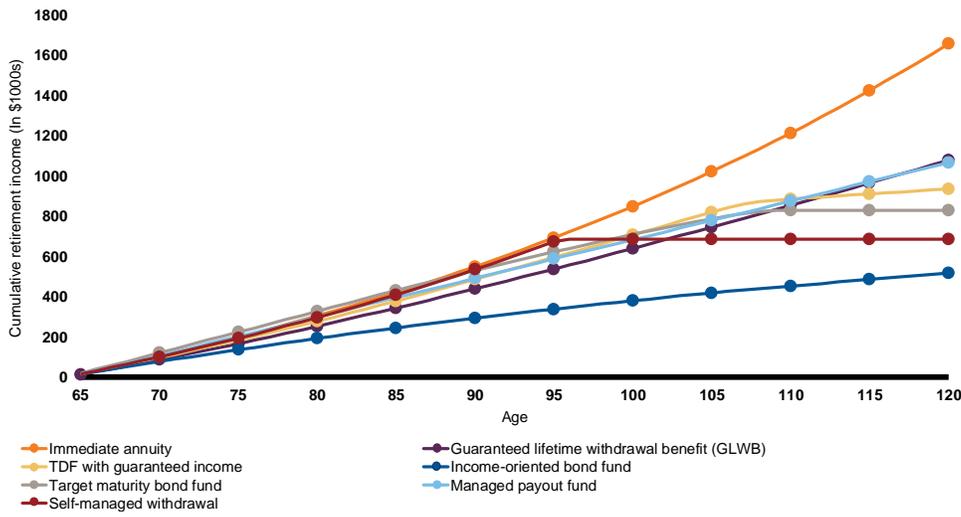
Exhibit 5 depicts the cumulative payout each type of product is expected to provide during the retirement period. Cumulative spending is a function of the asset allocation before and after retirement and the assumed annual withdrawal percentage. Russell Investments' research shows that up to 50% of the income required to sustain your retirement can come from post-retirement investment growth—which means the asset allocation after you retire is as crucial to funding your desired lifestyle as saving for retirement during your working years.

Exhibit 5 reveals that immediate annuities have the highest cumulative payout if life expectancy is longer than age 85 but provides no liquidity or remaining balance.⁸ This remains the case in weak market environments, however in strong market environments, cumulative spending for most product types exceeds the immediate annuity, although none can provide the same level of predictability.

⁷ The 4.5% withdrawal rate is applied to the balance at retirement, not applied to the varying balance each year.

⁸ An annuity can be purchased with a death benefit, term certain or commuted value rider to provide payment(s) to beneficiaries upon death.

Exhibit 5: Cumulative payout expected

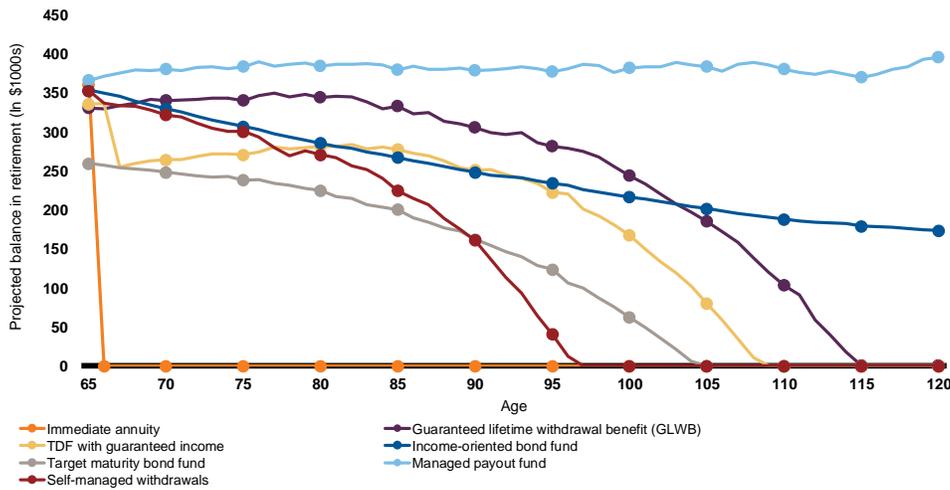


Source: Russell Investments.

In Exhibit 6, we analyze the potential for having a remainder account balance at the time of death for each type of product. The potential for a remainder account balance varies greatly among product categories; this is partly by design. Certain products, such as some managed payout funds, are specifically designed to leave a remainder balance and generally have higher post-retirement allocations to growth assets to achieve the outcome. Others are designed to leave a lower remainder balance in return for lower risk of capital loss by using primarily fixed income instruments to provide sufficient income with ample downside protection. Still other products are designed to exhaust the account balance fully during the retirement period.

Of course, the amount withdrawn over time also impacts the end-of-life account balance. The mechanics of each individual product dictate whether the distributions are automatic or manual, whether a fixed distribution percentage is targeted or whether the amount and frequency of distributions from the product are left to the discretion of the retiree. Certain products automatically distribute a portion of the account balance at regular increments, while others put the retiree in charge of determining how much and when to distribute for spending. A high remaining balance is not necessarily a better outcome than a low one. At the extreme, one could spend \$1 per year from their retirement account and be left with a sizeable balance when life expectancy is reached, but is that a positive outcome? Each retiree's individual preferences for spending potential, upside potential and downside protection can be largely accommodated with the variety of product categories available today.

Exhibit 6: Remainder retirement account balance



It's unlikely that the retirement income marketplace will mature into a universal, one size fits most solution like traditional target-date funds have done.

Source: Russell Investments.

The average lifespan in the United States is continually increasing, in fact, 50% of children born in 2007 are expected to be alive at 104 years old!⁹ For today's retirees however, the average life expectancy is age 87.¹⁰ In Exhibit 6 we compare retirement outcomes at age 87 in different market conditions to show the income generated and remaining balance for a retiree with a typical life span. The table illustrates how participants can prioritize different retirement goals like spending, safety and predictability and bequest motives with different types of solutions.

Exhibit 7: Cumulative spending and remainder account balance at average life expectancy

	STRONG MARKETS		NORMAL MARKETS		WEAK MARKETS	
	Cumulative spending	Remaining balance	Cumulative spending	Remaining balance	Cumulative spending	Remaining balance
Immediate Annuity	\$481,273		\$481,273		\$481,273	
Guaranteed Lifetime Withdrawal Benefit	\$623,387	\$848,851	\$376,009	\$323,143	\$257,051	\$87,294
TDF with Guaranteed Income	\$542,792	\$775,360	\$425,005	\$262,876	\$333,667	\$45,539
Income-oriented Bond Fund	\$787,667	\$349,970	\$264,341	\$261,839	\$142,406	\$192,364
Target Maturity Bond Fund	\$618,644	\$723,325	\$470,825	\$173,913	\$350,330	
Managed Payout Fund	\$786,076	\$932,863	\$429,601	\$373,026	\$251,964	\$177,007
Self-Managed Withdrawals	\$458,202	\$569,326	\$458,202	\$206,760	\$442,731	\$9,087

Source: Russell Investments.

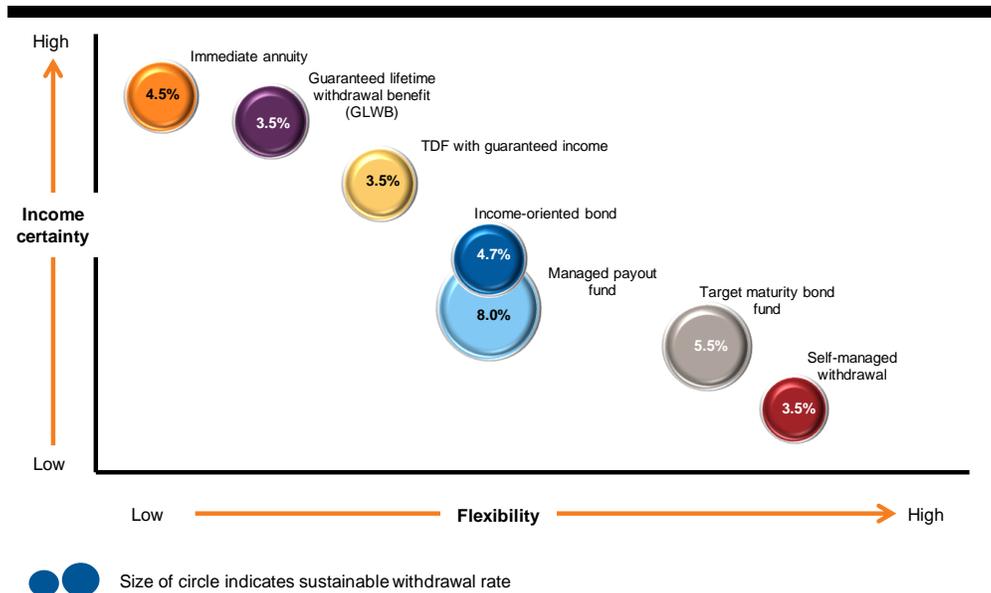
In Exhibit 7, we include the sustainable withdrawal rate for each product category on a three-dimensional continuum that plots the solutions according to the degree of income certainty and financial flexibility offered. Managed payout funds can provide higher than spending with a low probability of exhausting the account balance due to the payout structure, but the trade-off is

⁹ Human Mortality Database, University of California Berkley

¹⁰ Society of Actuaries, RPH-2014 mortality tables

that there is less predictability as the spending can fluctuate greatly in different market conditions. The annuity provides a 4.5% withdrawal rate with no chance of running out of money.¹¹ One could generate the same annual payout rate autonomously with a self-managed withdrawal strategy, but would have to accept a 25% chance of outliving the retirement assets, jumping to a 75% chance in weak market conditions.

Exhibit 8: Continuum of lifetime income solutions



Source: Russell Investments. For illustrative purposes only. Sustainable withdrawal rate is the annual rate at which participants can draw down their assets in retirement with 85% probability of success (i.e., not exhausting the assets in their actuarial lifetime under normal market conditions). Russell Investments is not endorsing 85% as an appropriate probability of success; rather, we are acknowledging that most retirees would like to achieve the highest withdrawal rate possible where the probability of success exceeds their minimum individual threshold. Withdrawal rates for different probabilities of success are shown in the Appendix. The sustainable withdrawal rate shown is the first year in retirement and may vary in future years.

Level setting with immediate annuity as the baseline

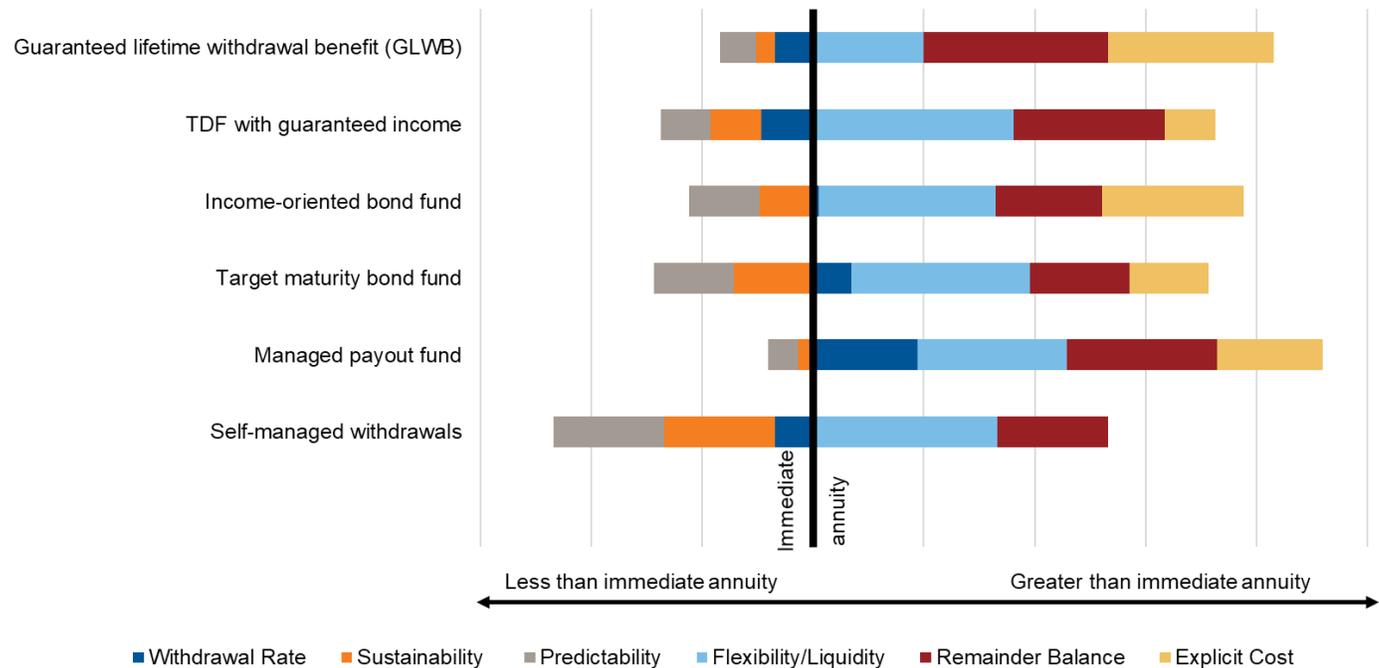
In Exhibit 9, the immediate annuity is used as the baseline for comparison for all the other product categories. We chose the immediate annuity as the baseline because it represents the most direct solution to manage longevity risk and provide lifetime income. Admittedly, the decision to purchase an annuity is complex, and there are implicit costs and risks, but in exchange, the retiree receives full protection from the uncertainty of the markets, and is free from future responsibility for income fluctuations, investment risk, asset allocation decisions and accounting for effects of interest rates and inflation.

The primary challenge with immediate annuities is they are generally irrevocable, inflexible and illiquid. As illustrated in Exhibit 7, relative to other the product types, the immediate annuity trades off flexibility, access to account balance and potential for a remainder balance, for certainty and sustainability, in varying degrees. Of course, as we've established, no other product category can provide the same probability of success as the immediate annuity, if probability of success is defined as a participant not outliving their retirement assets. We know that according to surveys data, many retirees fear financial ruin even more than they fear declining health or even death,¹² but many retirees also have a floor of Social Security to rely on, and other household assets and incomes. So, we should not be bound by a single definition of success. The success metrics for each retiree will be determined by individual objectives and circumstances. The side of the distribution where each retiree's primary needs

¹¹ Does not account for counterparty risk of the insurance provider.
¹² Transamerica Center for Retirement Studies, 2016.

fall (i.e. left or right) indicates which products categories one may find to be the most attractive on the basis of the retirement outcomes we have discussed up to this point.

Exhibit 9: Baseline comparison with immediate annuity



Source: Russell Investments.

Mapping lifetime income solutions to participant preferences

To map the lifetime income solutions to employees’ needs in retirement (see Exhibit 10), we must first provide a holistic assessment of each solution on these metrics. Let’s first consider sustainability, which is the goal of not outliving one’s assets in retirement. The probability of running out of money in retirement is low with all these products, even in poor markets, due to the payout mechanism and/or option to annuitize embedded within them. They are designed to produce sustainable lifetime income, and, in our independent assessment, pass the test.

The next consideration is predictability, or consistent income throughout retirement. The types of solutions that deliver the most income consistency are guaranteed solutions like the immediate annuity and guaranteed lifetime withdrawal benefit (GLWB) and fixed income solutions like the income-oriented bond fund and target maturity bond fund. The TDF with guaranteed income does reduce income volatility,¹³ but to a lesser degree, because part of the account balance remains invested in the target date fund glidepath and may require spending adjustments based on capital market performance. The TDF with guaranteed income does establish a predictable and guaranteed income floor that could be used to cover non-discretionary expenses such as food, housing, transportation and health care. Conceivably, discretionary spending outside these items is easier to adjust if one were to experience an unexpected drop in the remaining TDF account balance.

Then, let’s consider financial flexibility and liquidity, which is defined as maintaining control over assets throughout the retirement period. The only solution that is truly illiquid is the immediate annuity.¹⁴ The guaranteed lifetime withdrawal benefit (GLWB) and TDF with guaranteed income offer less liquidity than the rest. The GLWB can provide liquidity, but at a

¹³ Assumes the participant elects to annuitize the portion of their account balance allocated to pre-fund the annuity purchase.

¹⁴ Subject to annuity contract terms with the insurance company.

price. Any withdrawal in excess of the annual guaranteed income amount will reduce the benefit base and, as a result, also reduce the future guaranteed income amount. The TDF offers partial liquidity. The portion of the account balance that remains invested in the TDF is liquid; the portion annuitized by the participant is not¹⁵.

Finally, we consider the sustainable spending level and remaining account balance at the time of death. The two goals are inter-related. Solutions that maintain a higher allocation to equities in retirement, such as the managed payout fund, guaranteed lifetime withdrawal benefit (GLWB) and target-maturity bond fund,¹⁶ will generally support higher sustainable spending levels and leave a higher remaining account balance at the time of death. However, an appetite for risk is required, and poor market returns, especially early in retirement, can cause sustainable spending levels to decline below the spending levels of other less aggressive product types.

Exhibit 10 provides a mapping of the type of participant each product category may be most appropriate for based on the participant's financial needs, objectives and preferences along with the potential strengths and weaknesses of each product category.

Exhibit 10: Mapping the product categories to retiree needs and preferences

TYPE	MANAGED PAYOUT FUND	INCOME ORIENTED FIXED INCOME FUND	TARGET MATURITY BOND FUND	TARGET DATE FUND WITH GUARANTEED INCOME	GUARANTEED LIFETIME WITHDRAWAL BENEFIT (GLWB)	IMMEDIATE ANNUITY
Pros	Fully liquid Simple for participant Captures market upside Higher likelihood of positive account balance at death Low chance of exhausting balance due to payout structure	Fully liquid Simple for participant Lower market and sequence of return risk More predictable payout than equity-based solutions Income-based spending approach may maintain account balance	Fully liquid Precise and predictable payout May capture market upside Participant can easily adjust income amount Time-based payout approach offers maximum flexibility Only a fraction of the account balance is required	Partially liquid Guaranteed income stream; explicit longevity risk protection Captures market upside High utilization potential Minimizes participant decision risk Qualifies for QDIA safe harbor Gradual annuity purchase lowers premiums and mitigates timing risk Flexible design provides participant choice	Fully liquid at a cost Guaranteed income stream that may increase; explicit longevity risk protection Captures market upside High utilization potential Minimizes participant decision risk Qualifies for QDIA safe harbor Gradual annuity purchase lowers premiums and mitigates timing risk Custom glide path and control over managers	Guaranteed income stream; explicit longevity risk protection Precise and predictable payout Fully eliminates market risk Cost of living adjustment explicitly manages inflation risk

¹⁵ Subject to annuity contract terms with the insurance company.

¹⁶ Assumes the participants invests the portion of the account balance not invested in the target-maturity bond funds in a target-date fund with a glidepath approximated by the Morningstar industry average. The participant is responsible for investing the portion of the account balance not invested in the target-maturity bond funds.

Cons	<p>No explicit longevity risk protection or guaranteed minimum payout</p> <p>High market and sequence of return risk</p> <p>Income is highly variable and dependent on capital markets</p>	<p>No explicit longevity risk protection or guaranteed minimum payout</p> <p>Income is variable and dependent on capital markets</p> <p>No appreciation beyond bond return so may not provide sufficient income</p> <p>Inflation erodes purchasing power of future cash flows</p>	<p>Requires ongoing maintenance</p> <p>Participant responsible for investing/rebalancing remainder of portfolio</p> <p>Exposure to interest rate risk for participants redeeming prior to maturity</p>	<p>Opportunity cost for participant that don't annuitize</p> <p>Possible to "lock in" insufficient income amount</p> <p>Moderate market and sequence of return risk</p> <p>Operational complexity and potential recordkeeping issues</p> <p>Interest rate risk at point of annuitization</p>	<p>Excess withdrawals reduce future income amount</p> <p>Generally higher expenses</p> <p>May be rigid and inflexible</p> <p>Product complexity with GLWB structure</p> <p>Operational complexity and potential recordkeeping issues</p>	<p>Lack of liquidity and control</p> <p>Lack of flexibility for unexpected expenses</p> <p>No market upside potential</p> <p>No remainder account balance</p> <p>Participant decision risk</p>
Most appropriate for those who:	<p>Value liquidity and control</p> <p>Are comfortable with stock market volatility</p> <p>Have aspirational lifestyle, estate or bequest motives</p> <p>Value potential for higher spending over income stability</p> <p>Are able to adjust annual spending to match income</p>	<p>Value liquidity and control</p> <p>Are not comfortable with stock market volatility</p> <p>Value consistency of income over level of income and upside potential</p> <p>Prefer to spend from income and maintain current asset level</p> <p>Are able to adjust annual spending to match income</p>	<p>Value liquidity and control</p> <p>Have pre-determined spending needs</p> <p>Value maximum flexibility to meet unexpected expenses</p> <p>Are comfortable managing their own asset allocation</p>	<p>Value liquidity and control</p> <p>Want to annuitize a portion of their retirement balance</p> <p>Value flexibility to meet unexpected expenses</p> <p>Want to establish a guaranteed income floor to meet essential spending needs</p>	<p>Have relatively predictable spending needs</p> <p>Have aspirational lifestyle, estate or bequest motives</p> <p>Value potential for higher spending over income stability</p>	<p>Value consistency of income over liquidity and control</p> <p>Have predictable spending needs</p> <p>Are not comfortable with stock market volatility</p> <p>Do not wish to make additional financial decisions in retirement</p>

Landing the plane

The point of retirement does not need to be a point of abrupt disembarkation for participants, but rather smooth passage into another phase of their journey. To support participants with this transition, the next step for DC plan sponsors is to include solutions in the investment menu that convert accumulated retirement savings into a lifetime income stream. A variety of valid approaches exist, and it is unlikely that any one lifetime income solution will fit the majority of employees. Ideally, plan sponsors will elect to a range of lifetime income solutions, leveraging a framework to determine how different product types align with participant needs, preferences and decision factors.

Appendix

While not intended to be an exhaustive list of products in each category, the products below represent examples of products within each retirement income category available in the marketplace today

Self-managed withdrawals	<p>Self-managed means participants manage their own retirement income by developing an investment plan after retirement along with self-driven annual withdrawals. In this analysis we assume annual withdrawals of 5% of their account value, in line with both the GLWB and the managed payout fund. This strategy assumes that participants understand their income needs and have the willpower to stick to the plan.</p>
Fixed immediate/ fixed deferred annuities (includes QLACs)	<p>Fixed annuities are an insurance product that allow participants to exchange their retirement assets for a defined periodic payment starting now (e.g., a fixed immediate annuity) or at a future date (e.g., a fixed deferred annuity). Due to interest compounding, the longer the income payment from fixed deferred annuities is delayed, the greater the income payment will be. Qualified Longevity Annuity Contracts (QLACs), sometimes referred to as “longevity annuities,” are a type of deferred annuity where the income payments are deferred until late in retirement. QLACs purchased within retirement accounts using qualified funds have limits, currently the lesser of 25% of the account balance or \$135,000 and are exempt from required minimum distributions until age 85.</p> <p>Representative products: Annuities offered by various insurers: Immediate, Fixed, Fixed Deferred and Longevity Insurance/QLAC. Out of plan annuity purchase platforms include Hueler Income Solutions and Fidelity Annuity Exchange.</p>
Variable annuity with guaranteed lifetime withdrawal benefits (GLWBs)	<p>GLWBs allow participants to invest in a portfolio of stocks and bonds (e.g., a static 60/40 stocks/bonds mix) with a guaranteed withdrawal rate based on a high-water mark of the account value. Upon retirement, a participant may withdraw a contractually defined amount for life, regardless of market performance. This account value is tied to the high-water mark of the participant’s account balance in the GLWBs, and whenever the participant’s account value reaches a new high-water mark, the participant is entitled to an increase in the guaranteed withdrawal amount. Each year on the participant’s birthday, if the participant’s account value in the GLWB exceeds the prior year’s GLWB benefit base, the benefit base is increased to match the account value on that date.</p> <p>Representative products: AllianceBernstein Lifetime Income Strategy, Prudential Income Flex</p>
Target date fund with guaranteed income	<p>A target date fund that allocates to embedded annuities over time to hedge longevity risk. At retirement, participants are provided with the option to use a portion of their account balance to purchase an individual annuity contract directly from insurance companies that will provide guaranteed lifetime income. Only a portion of assets go toward purchasing the annuity as determined by the asset allocation glide path and the remaining balance can remain invested in the target date fund series or be transferred to other investment options.</p> <p>Representative products: Blackrock LifePath Paycheck, State Street IncomeWise</p>
Managed payout fund	<p>A broadly diversified fund specifically designed to automatically provide equal and predictable monthly income payments to investors. The payments may be made using investment income, capital gains and return of principal and there are no guarantees related to the payout amount. The funds generally target a specific payout percentage, but actual income distributions may vary based on financial market performance. Managed payout funds can be stand-alone or integrated into a target date fund series.</p> <p>Representative products: T. Rowe Price Retirement Income 2020 Fund, Fidelity Retirement Income Solutions</p>

Income-oriented bond fund	<p>Fixed income funds that focus on income as a driver of total fund return. Income-oriented bond funds target a high and consistent monthly income distribution by allocating to higher yielding securities while seeking to preserve principal over time.</p> <p>Representative products: PIMCO Income Fund, Putnam Income Fund</p>
Target maturity bond fund	<p>Fixed income funds with a time-based payout mechanism that targets a defined payout at a pre-determined time in the future. The funds use a laddered bond allocation strategy to invest in fixed income securities that mature within a specific year, resulting in repayment of principal plus interest income in that specific year.</p> <p>Representative products: Franklin Templeton Retirement Payout Funds</p>
Managed accounts with payout component	<p>These are a feature of a managed account service that provides advice on converting savings into retirement income during the post-retirement decumulation phase. The spending advice can facilitate stable monthly payouts with the option to purchase an annuity out of plan. This product category was excluded from the quantitative analysis because the asset allocation and spending advice is unique to each individual.</p> <p>Representative products: Financial Engines Income+, Morningstar Retirement Manager</p>

Assumptions used in the analysis of lifetime income product types

General assumptions

1. Investor

- a. Age: 55
- b. Gender: Female
- c. Retirement age: 65
- d. Current account balance: \$150,000
- e. Current salary: \$60,000
- f. Salary growth rate: 3% (nominal value)
- g. Contribution rate: 10% of salary, along with 4% match from the employer
- h. Projected balance at retirement if invested in the Morningstar industry average glide path: \$353,000

2. Investment Assumptions

The following assumptions are applicable to some but not all product categories. Non-guaranteed account refers to investments administered by either a provider or the investor. Balance from non-guaranteed account is for retirement spending purposes.

- Investment strategy for non-guaranteed account during pre-retirement: average Morningstar industry glide path
- Investment strategy for non-guaranteed account during retirement: balanced fund; the ratio between stocks and bond can be varied. It assumed to be 50/50 in most cases unless otherwise stated
- Spending withdrawal rate from non-guaranteed accounts: 4.5%
- Strategic forecasts as of 12/31/19, produced by Russell Investments
- The mortality table is the 2014 RPH tables, provided by the Society of Actuaries

Modeling assumptions

There are aspects of the lifetime income products that analysis does not model, including liquidity advantage, credit risk, complement resources and tax advantages.

Appendix Exhibit 1: Self-managed withdrawals

INPUT	ASSUMED VALUE	DESCRIPTIONS
Withdrawal rate	4.5%	The payout rate used to calculate annual payout at the end of each year
COLA	2%	Cost of living adjustment, used to calculate payment stream

Modeling steps

- Participant invests and contributes in a balanced fund portfolio containing 50% equity
- The withdrawal rate is applied to the balance at retirement, not to the varying balance each year

Appendix Exhibit 2: Immediate annuity

INPUT	ASSUMED VALUE	DESCRIPTIONS
Crediting rate	1.5%	Interest rate credited to the account balance before annuitizing
COLA	2%	Cost of living adjustment, used to calculate payment stream
Cashflow start age	Immediate annuity: 65	Age of the primary investor at which cash flow starts
Cashflow stop age	120 (i.e. the investor will receive the cashflow for life)	Age of the investor at which cash flow stops
Annuity ratio	100%	The proportion of the balance that is used for purchasing annuity. The rest stays in a non-guaranteed account

Modeling steps

- Participant continues contribution into a non-guaranteed account until age 65, at which point, a fixed immediate annuity is purchased, which results in the payment being received immediately

Appendix Exhibit 3: Variable annuity with guaranteed lifetime withdrawal benefits (GLWBs)

INPUT	ASSUMED VALUE	DESCRIPTIONS
Secure income level (SIL)	100%	Level of income protection, determining how much of the balance is to be allocated to Secure Income Portfolio (SIP) for GLWB. The rest is kept in non-guaranteed account
Withdrawal rate (payout percentage)	Depends on retirement age, starting at 5.5% for 50 years old and gradually decreasing to 4% for 65 years old	The rate used to calculate guaranteed annual withdrawal amount (by multiplied by Secure Income Base)
Fees	Non-guaranteed balance: 6 basis points Secure Income Portfolio (SIP): 120 basis points	Fees are applied at the end of the year on the account balance (and not the income base)

Modeling steps

- Participant chooses the secure income level as a percentage of the current account balance
- In the accumulation period, a portion of the savings ($1/(\text{retirement age} - \text{current age}) \times \text{SIL} \times \text{current balance}$) is moved into the Secure Income Portfolio (SIP) each year
- SIP is invested in 60/40 balanced fund
- The income base starts out the same as the SIP balance. At the end of each year, the income base is assessed as the larger of the current SIP balance or last year's income base, so that the income base never decreases (high-water mark)
- At the end of the year, the SIP balance and non-guaranteed account balance are reassessed, which takes into account any contributions, distributions, or applicable fees
- At retirement, the annual withdrawal amount is calculated as the SIP income base multiplied by the withdrawal rate
- Every year into retirement, the annual withdrawal amount is adjusted upward if the income base increases, but it is never lower than the amount calculated at retirement

Appendix Exhibit 4: Target date fund with guaranteed income

INPUT	ASSUMED VALUE	DESCRIPTIONS
Income unit glide path	Starting at 7% of total assets at 10 years before retirement, increasing gradually to 25% by retirement	The income unit is used to purchase annuity from insurance companies for guaranteed income
Fees	15 basis points	

Modeling steps

- Participants are in a Target Date Fund before retirement
 - Further than 10 years from retirement, the target date fund glide path is the same as assumed provider glide path
 - Between 10 years before retirement and retirement, an additional asset class is added: income unit. The allocation to income unit increases gradually from 7% at 10 years before retirement to the maximum of 25% at retirement. The rest (called "growth unit") continues to follow the glide path

- At retirement
 - The income unit is converted to immediate annuity
 - The growth unit becomes a non-guaranteed account invested according to the target date fund glide path, providing retirement income to participant

Appendix Exhibit 5: Managed payout fund

INPUT	ASSUMED VALUE	DESCRIPTIONS
Payout target	5%	The payout rate used to calculate annual payout at the end of each year
Fees	71 basis points	

Modeling steps

- Participants stay in a target date fund until retirement
- Upon retirement, the balance is transferred into a managed payout fund
 - Investment strategy is the same as the target date retirement income fund
 - End of year balance is netted from distributions and fees
 - At the end of each year, the next year's annual payout amount is calculated as *payout target x average NAV of balance over last five years*
 - The withdrawal amount is a constant percentage of available assets (same percentage, dollar amount changes)

Appendix Exhibit 6: Target maturity bond fund

INPUT	ASSUMED VALUE	DESCRIPTIONS
Starting age for purchasing laddered bond solution	60 (retirement age – longest bond maturity)	The age at which the investor will start investing into a laddered bond solution
Longest bond maturity	5	The highest maturity of the bonds in the bond ladder
Target spending level	6%	Percentage of the balance at starting age desired for retirement income. This amount will be used as principal for all laddered bond fund purchases
Fees	31 basis points	

Modeling steps

- During pre-retirement, the participant is in a target date fund that follows the Morningstar industry average glide path
- At the starting age for purchasing a laddered bond solution, the investor dedicates a portion of the balance to creating a bond ladder
 - The investor wants to receive target spending level x the balance at the starting age as principal for every year
 - Starting at 5 years before retirement (the number of years depends on the longest bond maturity), the investor purchases funds 5-year maturity with the principal calculated above until the target date fund balance runs out
 - The rest of the money stays in target date fund

- When a bond matures, both the principal and the interest will be used for retirement income. Bond fund is assumed to have 80% Bloomberg Barclays US Aggregate Bond Index /20% ICE BofA US High Yield Index composition. This assumption was made based on the provider's credit quality allocations as of 03/31/20

Appendix Exhibit 7: Income-oriented bond fund

ASSET CLASS	PROVIDER ALLOCATION	MODELED ALLOCATION
U.S. Government Agencies	34.9%	35%
Non-Agency Mortgage-Backed Securities	19.5%	20%
Corporate Bonds & Notes	14.3%	14%
Asset-Backed Securities	12.8%	13%
U.S. Treasury Obligations	7.2%	7%
Sovereign Issues	4.0%	4%
Loan Participations and Assignments	3.6%	4%
Short-Term Instruments	3.0%	3%
Other	0.7%	0%

Additional inputs

INPUT	ASSUMED VALUE
Fees	105 basis points – Institutional Class Management Fees: 0.50% Interest Expense: 0.55% Total Annual Operating Expenses: 1.05%

Modeling steps

- During pre-retirement, participants invest in Morningstar industry average glide path
- At retirement, participants use retirement balance to invest in the income-oriented bond fund
- At the end of the year, all the dividends/income returns/capital appreciations are used for spending purposes; the principal remains invested at the above allocations

Sustainable withdrawal rate

Definition

- The annual rate at which a participant can draw down their assets in retirement with 85% probability of not exhausting their assets in their actuarial lifetime
- Accounts for both market performance and mortality rate
- Initial payout divided by balance at retirement
 - Real yield rate = 1.06%
 - Annuity factor = 22

- Annuity payout = 4.53%
- Chance of exhausting balance = 0%
- Does not account for counterparty risks with the insurance provider

Appendix Exhibit 8: Sustainable withdrawal rate. Variable annuity with guaranteed withdrawal benefits (GLWB)

Assumes secure income level of 100%

WITHDRAWAL RATE	PROBABILITY OF EXHAUSTING BALANCE
3.5%	3.4%
4.0%	6.9%
4.5%	12.0%
5.0%	18.8%
5.5%	27.1%

Appendix Exhibit 9: Sustainable withdrawal rate. Target date fund with guaranteed income)

Combination of growth unit and income unit withdrawal rates

WITHDRAWAL RATE	PROBABILITY OF EXHAUSTING BALANCE
3.8%	2.8%
4.2%	6.5%
4.6%	12.4%
5.0%	20.1%
5.3%	29.0%

Appendix Exhibit 10: Sustainable withdrawal rate. Managed payout fund

Payout target (may differ from product-specific targets)

PAYOUT TARGET	PROBABILITY OF EXHAUSTING BALANCE
8.0%	0%
8.5%	0%
9.0%	0%
9.5%	0%
10.0%	0%

Appendix Exhibit 11: Sustainable withdrawal rate. Target maturity bond fund

Target spending level

TARGET SPENDING LEVEL (AS A % OF BALANCE 5 YEARS BEFORE RETIREMENT)	PROBABILITY OF EXHAUSTING BALANCE
5.0%	1.9%
5.5%	4.4%
6.0%	8.2%
6.5%	14.2%
7.0%	22.4%

Sustainable withdrawal rate – Income-oriented bond fund

1. There is no sustainable withdrawal rate because the fund uses dividend interest and capital appreciation for income
2. A sustainable withdrawal rate of 4%-5% was approximated using the annual distribution yield
3. The assumed distribution yield only includes the dividend distribution Any additional year-end distribution made with excess income accrued daily throughout the year were not included

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