

RESEARCH

Planning and Investing for Retirement Consumption

September 2017

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For most people, a successful retirement begins with being able to maintain the standard of living they are accustomed to. This means the primary goal of their retirement savings is to help sustain their desired, inflation-adjusted expenses throughout retirement: a “consumption stream.” Defining the goal as an in-retirement consumption stream is a key step in designing an appropriate investment solution.

Any asset allocation decision represents a tradeoff between the opportunity of future growth and reducing uncertainty about future outcomes. Accordingly, a solution to the retirement problem should provide the ability to grow assets in an effort to increase expected consumption in retirement while seeking to manage the uncertainty of retirement consumption. Clearly defining the risks for the goal can help identify investment instruments that help manage these risks effectively and lead to a better tradeoff for investors.

If the goal is a future consumption stream, the key uncertainty is how much consumption the accumulated savings can sustain. This uncertainty is driven by the uncertainty of future stock and bond returns, interest rates, and inflation. We call these market risk, interest rate risk, and inflation risk.

In this article we describe Dimensional’s approach to managing the uncertainty of in-retirement consumption, considering the key risks that affect this uncertainty. After the appropriate risk management strategy for the goal is identified, the asset allocation question becomes how to balance the tradeoff between growth assets and risk management assets. This question can then be addressed using tools from modern life cycle finance research. Separate from market, interest rate, and inflation risks is longevity risk. We will describe one approach to managing this risk.

As discussed below, identifying the appropriate risk management strategy is not only a crucial element of the asset allocation question but also a key aspect of planning and monitoring progress towards the retirement goal. The risk management strategy allows communication in terms of units that matter for the goal (meaningful communication)—in this case a future consumption stream. Through meaningful communication, the risk management strategy enables savers to make important decisions. How much do I need to save? When can I retire? How much can I expect to withdraw from my retirement account every month? What is the uncertainty around these estimates?

While this article does not address the details of implementation, Dimensional has developed a set of solutions, including target date retirement income funds, that implement the life cycle approach we describe here. Retirement investors can use Dimensional’s mutual fund solutions as a standalone solution or in combination with other solutions that help manage the uncertainty of future retirement income, including annuities.

RETIREMENT CONSUMPTION AND RISK MANAGEMENT

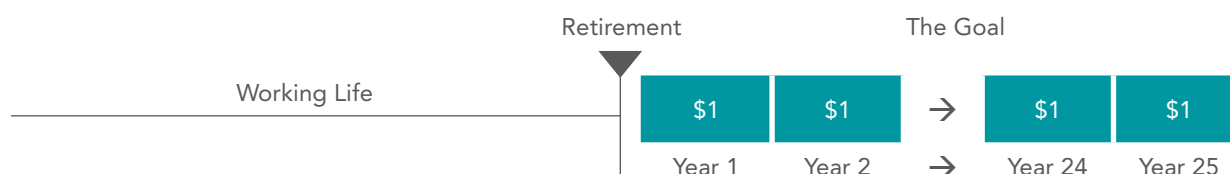
The first step to determine how to manage key risks is to define how long accumulated savings can be expected to support in-retirement consumption. Starting with life expectancy at the typical retirement age is usually a good place to begin. It also makes sense to include a buffer to account for uncertainty about life expectancy. Assuming an average life expectancy of 20 years plus a buffer of five years, the retirement goal can be thought of as \$1 of inflation-adjusted consumption over 25 years.

With this framework for the withdrawal period, we can think about a solution that manages the volatility of how much in-retirement consumption an investor’s accumulated savings can support over that period. At any point in time, the goal illustrated in **Exhibit 1** has a cost, which can be computed as the present value of the future cash flows. This cost can be estimated using real interest rates. Real interest rates are used because we think of the consumption stream in inflation-adjusted terms.

The cost of the goal will fluctuate with changes in inflation and interest rates. For example, if interest rates go down (up), the cost of the goal goes up (down). Stated differently, this implies that for a given account balance, the amount that can be consumed is lower (higher) when interest rates are lower (higher). Interest rates constitute a risk to the level of consumption that can be sustained from a level of savings. Inflation has a similar effect. The purchasing power of an account balance declines with positive inflation and increases with negative inflation.

The sensitivity of the goal to real interest rates and inflation depends on the maturity of the cash flows. The longer the average maturity, or more technically the duration of the cash flow, the higher the sensitivity.¹ An investment that matches the sensitivity of the goal to interest rates and inflation can reduce the uncertainty about how much consumption can be sustained with the investment. This can be achieved by computing the duration of the in-retirement consumption stream and constructing an inflation-protected portfolio of government bonds with the same duration. This is an example of liability-driven investing or “LDI.”²

Exhibit 1: An Inflation-Adjusted Income Stream in Retirement



For illustrative purposes only. Not guaranteed.

1. Duration is a measure of the sensitivity of a cash flow stream (like a bond) to interest rates. It is a weighted average maturity across the cash flows, with weights given by the relative present value of each cash flow.
 2. A liability-driven investment (LDI) strategy is designed to focus on assets that match future liabilities. LDI strategies contain certain risks that prospective investors should evaluate and understand prior to making a decision to invest. These risks may include, but are not limited to, interest rate risk, counterparty risk, liquidity risk, and leverage risk.

How does this investment strategy reduce uncertainty about future consumption? Because the sensitivity of the investment to inflation and interest rate risks is the same as that of the goal, the value of the investment tends to increase (decline) when interest rates go down (up) or when inflation is positive (negative), thus protecting the future purchasing power of the portfolio.

A COMPLETE SOLUTION

The importance of the risk management framework goes beyond managing key risks like inflation and interest rates. The risk management strategy is a key element in balancing the tradeoff between growth opportunities and reducing the uncertainty of in-retirement consumption. It allows investors to control the level of exposure to market risk they desire in expectation of future growth over their working career and in retirement.

Modern life cycle research highlights the importance of considering (i) the entire life cycle of the investor and (ii) the sources of capital for the goal when making asset allocation decisions. The first element means considering the retirement consumption goal throughout the accumulation phase, not simply waiting until retirement to figure out how to sustain future consumption. The second point is important because different sources of capital can have different risks for the goal. Most people fund their consumption through a combination of accumulated savings (financial capital) and future savings (human capital). Early in an investor's career, most of the funding for retirement is expected to come from future savings, while financial capital is a small fraction of expected funding. At this stage, investing in a growth portfolio does not have a material effect on the overall risk of the total retirement funding because most of it will happen in the future. But as time goes by, the accumulated assets become a larger fraction of the funding and a more conservative allocation is needed for those assets.

The duration of the future consumption stream can be matched as early as around 20 years prior to retirement. Investors can devote a portion of their assets to risk management gradually over the 20 years, effectively saving toward "slices" of future consumption and reducing uncertainty about the level of retirement

consumption the savings can support. At retirement, the focus of the allocation is on providing clarity and confidence about how much consumption the savings can support, so the majority of the assets are invested in the LDI risk management strategy. Following this life cycle approach allows investors to seamlessly transition from their working life into retirement.

WITHDRAWAL RATES AND SEQUENCING RISK

The question about how much consumption a portfolio can generate over time is often asked in the context of a traditional portfolio of stocks and bonds in which the fixed income is used to reduce portfolio volatility rather than matched to the consumption goal. Given the portfolio, what is a withdrawal rate that the portfolio can sustain with a high likelihood?

Without the proper risk management, the estimated withdrawal rate is necessarily based on assumptions about future expected returns from that portfolio. This causes uncertainty, above and beyond the time series variability of returns, about how long money can last in retirement.

For investors drawing down from their portfolios, the sequence in which they experience returns may also matter to their ability to sustain consumption. For example, a sequence of bad market returns early in retirement increases the likelihood of running out of money early. Market risk is not the only cause of sequencing risk. Interest rates and inflation risks also matter. For example, an unexpected rise in inflation early in retirement increases the likelihood of running out of money early. A traditional allocation to stocks and bonds introduces sequencing risk because of market, interest rate, and inflation risks.

In contrast, the risk management strategy we described solves both of these problems. First, the LDI strategy does not need estimates of future returns to determine the level of income it can sustain. Market data on real interest rates at any point in time can be used. Because a retiree has the majority of their savings for the consumption goal invested in the consumption risk management strategy, the reliance on assumptions is greatly reduced. Second, because a large portion of the portfolio is invested in assets that hedge consumption risk, sequencing risk is also reduced.³

3. With the LDI approach, sequencing risk only comes through growth assets, which in retirement are a small fraction of the portfolio.

IMPORTANCE OF RISK MANAGEMENT FOR PLANNING

Having the right risk management strategy is also important to help investors plan toward retirement and monitor their progress. Retirement investors are often shown estimates of projected future income. It is important to realize that income projections can be very sensitive to future changes in the market, inflation, and interest rates, and there is no reliable way to say what those will be in the future. Without the proper risk management strategy, the estimates are not very meaningful. For income estimates to be meaningful to an investor, so that he or she can use them to plan for retirement, investors need a solution that manages risks related to the projections. If the goal is future consumption, the investment solution should manage consumption risk. This way, the uncertainty about future consumption can be reduced over time as participants approach retirement, providing clarity and confidence about the estimate of in-retirement consumption their savings can support.

If participants have tools that provide the right information and manage the right risks, they can be empowered to solve their retirement problem. How much do I need to save? When can I retire? What is the monthly paycheck I can expect from my savings? Dimensional has developed a retirement income calculator to help retirement savers plan and budget for retirement consumption.

LONGEVITY RISK AND ANNUITIES

In defining the consumption goal, we used life expectancy plus a buffer to account for uncertainty about one's lifetime. This approach is helpful in that it provides a reasonable framework for investors who plan to draw down from their portfolios. The approach may require an adjustment to consumption should the investor realize he or she needs to withdraw for longer than planned. For investors concerned

with longevity risk, one risk management tool is annuities. For example, investors could plan for the 25-year horizon using available target date retirement income funds and devote a portion of their savings to deferred annuities that start paying 25 years into retirement. Additionally, annuities with income benefits can also be used as a tool to reduce the volatility of lifetime retirement income.

Dimensional's retirement solutions, annuities, and a combination of both can be used to provide more clarity and confidence about future retirement consumption, making their planned consumption stream less subject to market, interest rate, inflation, sequencing of returns, and longevity risks.

CONCLUSIONS

A good retirement solution should provide robust and well-diversified strategies that are expected to grow the value of a participants' savings so they can afford higher levels of consumption in the future, while managing uncertainty about the level of future retirement consumption the portfolio can support.

The asset allocation framework should balance the tradeoff between the growth objective and managing the risks associated with the uncertainty about the level of consumption. The right risk management strategies remove the need to rely heavily on assumptions about future returns, making information about future retirement consumption meaningful. These tools can empower investors to make informed decisions about their retirement future.

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