A Framework for Efficient Drawdown: Finding a simple solution for a complex problem

Building and managing a drawdown strategy is complicated. How can you determine the appropriate amount of income to take from a portfolio and be sure that the portfolio has the best investment mix for that desired income level? In this Income 101 study session, we introduce the concept of an Efficient Drawdown Portfolio. The Efficient Drawdown Portfolio frames the development of a drawdown strategy as a straightforward choice between the desired level of income and the potential risk to that income. This approach is similar to the way that Markowitz's Modern Portfolio Theory reduces portfolio construction choices from an infinite set of potential asset allocations to a series of points along a line representing the highest potential return for a desired level of risk. The concept of an Efficient Drawdown Portfolio highlights the outcome-oriented nature of a drawdown strategy. It focuses on the tradeoff between an individual's two primary concerns: The amount of money that will be available to them in retirement and the likelihood of depleting their savings at that spending level.

Two elements define every drawdown strategy: a desired income level and an investment portfolio. Finding the optimal balance between these two elements is complex; there are not only an infinite number of possible asset allocations, but also an infinite number of possible income levels for each asset allocation. A typical approach to building a drawdown strategy is to surmise a reasonable spending rate for an existing portfolio allocation: for example, "How much can be safely drawn down from a 60/40 balanced fund?"

This method treats portfolio selection and desired income level as sequential problems. The danger of this simplified approach is that it fails to recognize the dynamic relationship between portfolio allocation and desired income level—that is, the fact that the portfolio that provides the best chance of achieving one desired income level may not be the best portfolio for another desired income level. As a result, determining an income level based on a portfolio's allocation is unlikely to result in an optimal drawdown strategy, even if the portfolio is efficient and the income level is reasonable.

Conventional drawdown strategies—finding a good investment portfolio and a reasonable drawdown rate—generally fail to address the dynamic relationship between desired income level, investment performance and risk to income

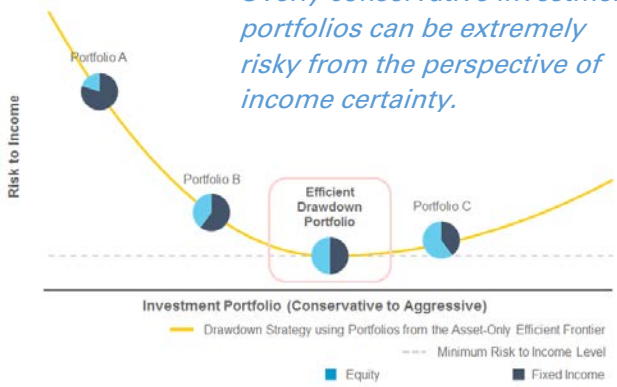
More importantly, this common approach fails to address an individual's two main concerns: their desired income level and the degree of certainty that they will be able to maintain that income level. Modern Portfolio Theory ("MPT") is a useful analogy here. MPT helped align portfolio construction decisions with the factors that are most relevant to the investor's experience: Individual investors typically aren't especially concerned about discrete pieces of their portfolio, such as their allocation to U.S. stocks versus international shares, or how much they have invested in corporate bonds; instead, they are focused on the portfolio's overall returns and risk of downturns. The mean variance efficient frontier identified by MPT enables investors to make tradeoffs about investment choices based on their impact on the overall portfolio's likely investment returns and risk. An optimal drawdown strategy

should accomplish something similar by enabling investors to make tradeoffs based on factors that are most relevant to them — namely, the level of income they want and potential risk to that income.

The starting point for building an optimal drawdown strategy is the concept of an Efficient Drawdown Portfolio. Optimal drawdown is built on two key observations: First, for any income level there is a portfolio on the efficient frontier that will minimize the risk to achieving that income level. Second, individuals will choose the portfolio that offers the lowest risk to their desired income level. The Efficient Drawdown Portfolio combines the desired income level with the asset allocation that minimizes the risk of generating that income.

The chart below illustrates the relationship between portfolios on the efficient frontier and the risk to a reasonable level of income.

Overly conservative investment portfolios can be extremely risky from the perspective of income certainty.



As we see in the chart, even with an efficient portfolio and a reasonable level of income (represented by portfolios A, B and C), there is still room to maximize the efficiency of the drawdown strategy—one that provides the desired level of income with the minimal amount of risk.

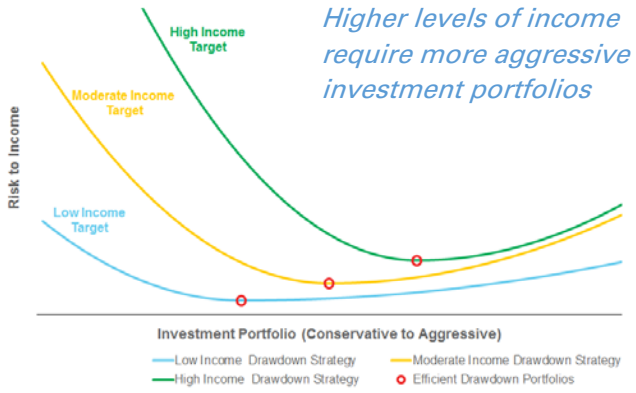
Finding the Efficient Drawdown Portfolio for a given level of income involves finding the "Goldilocks" position along the efficient frontier. When the investment portfolio is too conservative (Portfolios A and B) there is not enough growth potential to meet income needs. When the investment portfolio is too aggressive (Portfolio C) there is too much risk that investment losses could reduce the portfolio's ability to maintain a desired income level. One important observation: In a drawdown strategy, investment risk is not a good proxy for the risks to investors' income. In fact, some of the most inefficient strategies—those with the greatest risk to income, such as Portfolio A—are those that use the most conservative underlying investment portfolios.

Investment risk is not a good proxy for the risks that investors actually face in a drawdown strategy

To illustrate this with a real world example, consider an individual who has saved $500,000 at retirement and anticipates needing income of $40,000 per year for the next 15 years (we will talk more about the pros and cons of fixed versus infinite horizons in a later paper). By holding a 70/30 portfolio consisting of US Large Cap Equities and US Fixed Income, this investor has a 75% chance of maintaining that income level based on forward looking assumptions as of December 2017—which seems to be a reasonable outcome. But if we apply the concept of an Efficient Drawdown Portfolio, we find that this individual can increase their chance of maintaining their desired retirement income level to 77% by choosing a 42% allocation to equity. This portfolio will reduce the investor's likelihood of needing to change their retirement lifestyle, while also providing greater confidence given the lower asset class volatility. However, moving further into a more conservative portfolio reduces the potential success rate significantly: A 95% fixed income portfolio provides a less than 50% chance of maintaining their desired income level. This scenario highlights the concept that decisions based on investment risk alone can lead to a poor drawdown strategy.[1]

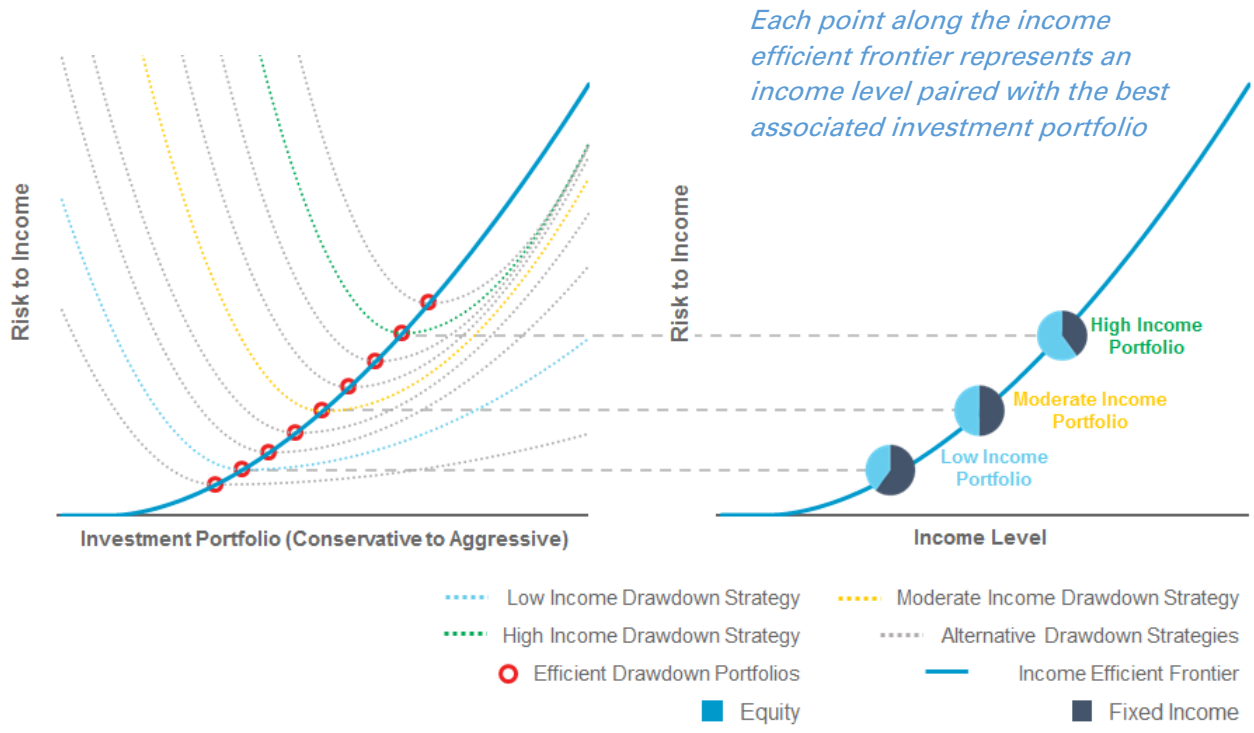
[1] The analysis above is based on LGIMA's long term capital market assumptions as of December 31, 2017. The magnitudes of the outcome are sensitive to the specific inputs, including; initial drawdown rate, time horizon, and portfolio composition.

Repeating the Efficient Drawdown Portfolio process for different levels of income (as seen in the chart below) shows how the optimal investment portfolio differs at various desired income levels. Higher levels of income require more aggressive investment portfolios, while lower levels of income can be sustained by more conservative investment portfolios.



Establishing the optimal portfolio for each income level simplifies the construction of a drawdown strategy to the choice of a point along the Income Efficient Frontier, as shown in the chart below. Each point on the blue line represents a different investment portfolio, illustrating the relationship between the desired level of income and the risk to that income in an Efficient Drawdown Strategy.

This new framework makes selecting an optimal drawdown strategy similar to the choice of an investment portfolio using Modern Portfolio Theory. The choice is a function of individual preference, based on consideration of the tradeoffs between desired income level and potential risk to that income. Other individual factors also influence each person's Efficient Drawdown Portfolio, including variables such as how long the income is needed, how frequently the income level will be adjusted and whether the income needs to adjust with inflation, as well as capital markets forecasts. We will explore these nuances in later publications of this series. But no matter which point on the Income Efficient Frontier the investor chooses, he or she will have an optimal drawdown strategy.



Disclosures:

Views and opinions expressed herein are as of April 2018 and may change based on market and other conditions. The material contained here is confidential and intended for the person to whom it has been delivered and may not be reproduced or distributed. The material is for informational purposes only and is not intended as a solicitation to buy or sell any securities or other financial instrument or to provide any investment advice or service. Legal & General Investment Management America, Inc. does not guarantee the timeliness, sequence, accuracy or completeness of information included. Past performance should not be taken as an invitation or guarantee of future performance and no representation, express or implied, is made regarding future performance.

Past performance, including hypothetical returns, does not guarantee future results, and the strategy bears the risk of potential loss.