

**Morningstar Investment Management Research Abstract**

# Gamma: Measuring Factors That Can Lead to More Retirement Income

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We set out to quantify the additional expected retirement income achieved by an individual investor who makes more intelligent financial planning decisions. We call this measure “gamma.”

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# Gamma Factors

Our research examined five different gamma factors:



Total Wealth Asset Allocation



Dynamic Withdrawal Strategy



Annuity Allocation



Asset Location and Withdrawal Sourcing



Liability-Relative Optimization



## Total Wealth Asset Allocation

This technique is designed to use human capital in conjunction with the market portfolio to determine the optimal equity allocation. Most techniques used to determine the asset allocation for a client are relatively subjective and focus primarily on risk preference (i.e., an investor's aversion to risk) and ignore risk capacity (i.e., an investor's ability to assume risk). In practice, we believe asset allocation should emphasize risk capacity in combination with risk preference. We determine an investor's risk capacity by evaluating his or her total wealth, which is a combination of human capital (an investor's future potential savings) and financial capital. We then can either use the market portfolio as the target aggregate asset allocation for each investor (as suggested by the capital asset pricing model) or build an investor-specific asset allocation that incorporates an investor's risk preferences. In both approaches, the financial assets are invested—subject to certain constraints—to achieve an optimal asset allocation that takes both human and financial capital into account.



## Dynamic Withdrawal Strategy

The majority of retirement research has focused on static withdrawal strategies, where the annual withdrawal during retirement is based on the initial account balance at retirement, increased annually for inflation. For example, a 4% withdrawal rate would really mean a retiree can take a 4% withdrawal of the initial portfolio value and continue withdrawing that amount each year, adjusted for inflation. If the initial portfolio value was \$1 million and the withdrawal

rate was 4%, the retiree would be expected to generate \$40,000 in the first year. If inflation during the first year was 3%, the actual cash flow amount in year two (in nominal terms) would be \$41,200. Under this approach, the withdrawal amount is based entirely on the initial income target, and is not updated based on market performance or expected investor longevity. The approach we use in this paper determines the withdrawal amount annually based on the ongoing likelihood of portfolio survivability and mortality experience.



## Annuity Allocation

Outliving one's savings is perhaps the greatest fears among retirees. Annuities allow a retiree to hedge away this risk and can therefore improve the overall efficiency of a retiree's portfolio. The contribution of an annuity within a total portfolio framework (benefit, risk, and cost) must be considered before determining the appropriate amount and annuity type.



## Asset Location and Withdrawal Sourcing

Tax-efficient investing for a retiree can be thought of in terms of both asset location and intelligent withdrawal sequencing from accounts that differ in tax status. Asset location is typically defined as placing assets in the most tax-efficient account type. For example, it generally makes sense to place less tax-efficient assets such as bonds (i.e., those where the majority of total return comes from coupons/dividends taxed as ordinary income) in retirement accounts (e.g., IRAs or 401(k)s) and more tax-efficient assets such as stocks (i.e., those where the majority of total return comes from capital

gains taxed at a rate less than ordinary income) in taxable accounts. When thinking about withdrawal sequencing, it typically makes sense to withdraw monies from taxable accounts first and more tax efficient accounts (e.g., IRAs or 401ks) later.



### Liability-Relative Optimization

Asset allocation methodologies commonly ignore the funding risks, like inflation and currency, associated with an investor's goals. By incorporating the liability into the portfolio optimization process it is possible to build portfolios that can better hedge the risks faced by a retiree. While these "liability-driven" portfolios may appear to be less efficient asset allocations when viewed from an asset-only perspective, we find they actually can be more efficient when it comes to achieving a sustainable retirement income.

From a holistic perspective, each of these gamma concepts can be thought of as actions and services provided by financial planners. In our research, we have taken a utility-function approach to examine the potential benefit of different income-maximizing decisions.

### Conclusion

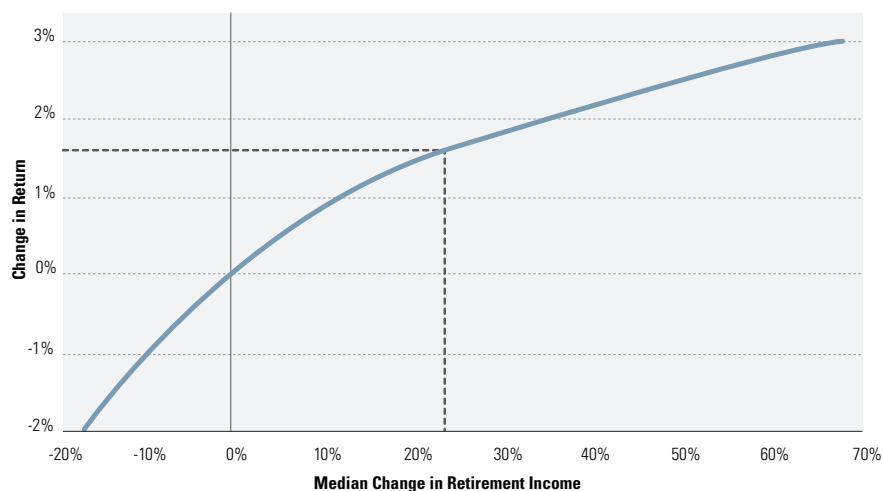
Among the five types of gamma we tested, using a dynamic withdrawal strategy was determined to be the most important, followed by making tax-efficient allocation decisions. We estimate a hypothetical retiree may generate 23% more income on a "utility-adjusted" basis using a gamma-efficient retirement income strategy when compared to our base scenario of a 4% constant real withdrawal and a 20% equity allocation portfolio. This additional income is equivalent to an annual arithmetic return increase of + 1.59% (i.e., gamma-equivalent alpha), which can represent a significant improvement in portfolio efficiency for a retiree. Unlike traditional alpha, which can be hard to predict, we believe that gamma (and gamma-equivalent alpha) can be achieved by anyone following an efficient financial planning strategy.

These results, while not actual investment results or guarantees of future results, offer a look at strategies designed to help retirees meet their goals.

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### Measuring the Increase in Income for Gamma-Optimized Portfolios

The five main gamma factors we examined generated 23% more retirement income for a hypothetical retiree than the base case portfolio (20% equity allocation) and the 4% withdrawal scenario.





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This piece is a summary of *Alpha, Beta and Now... Gamma* by David Blanchett, CFA, CFP and Paul Kaplan, Ph.D, CFA. Their research builds upon or references the work of many others in the field. You can read the entire paper and its citations at <http://global.morningstar.com/Gamma>.

### Important Disclosures

The information, data, analyses, and opinions presented herein do not constitute investment advice; are provided solely for informational purposes; and are not warranted to be correct, complete or accurate. The opinions and estimates noted herein are accurate as of a certain date and are subject to change. The charts and graphs within are for illustrative purposes only.

Monte Carlo is an analytical method used to simulate random returns of uncertain variables to obtain a range of possible outcomes. Such probabilistic simulation does not analyze specific security holdings, but instead analyzes the identified asset classes. The simulation generated is not a guarantee or projection of future results, but rather, a tool to identify a range of potential outcomes that could potentially be realized. The results from Monte Carlo and other simulations used for research within are hypothetical in nature and not actual investment results or guarantees of future results. Results noted may vary with each use and over time.

This should not be considered tax or financial planning advice. Please consult a tax and/or financial professional for advice specific to your individual circumstances.

### About Our Research

The research team within the Morningstar Investment Management division pioneers new investment theories, establishes best practices in investing, and develops new methodologies to enhance a suite of investment services. Published in some of the most respected peer-reviewed academic journals, the team's award-winning and patented research is used throughout the industry and is the foundation of each client solution. Its commitment to ongoing research helps maintain its core competencies in asset allocation, manager research, and portfolio construction. Rooted in a mission to help individual investors reach their financial goals, its services contribute to solutions made available to approximately 24.3 million plan participants through 202,600 plans and 25 plan providers.

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Our research has practical applications. Many of the components discussed in this paper are either currently being used in, or are in development to be used in Morningstar® Retirement Manager<sup>SM</sup> or Ibbotson's Wealth Forecasting Engine.

For more information, please visit <http://global.morningstar.com/mim>.