To Objectively Compare Target Date Funds, Focus on Outcomes

August 2018

Key takeaways

Variables often used to compare different target date funds don't provide sufficient information to evaluate a fund's likelihood of achieving long-term financial objectives.

The glide path plays a crucial role in the success or failure of an investor's financial outcome. Its design requires balancing major risks investors face before and during retirement.

We developed the glide path success (GPS) methodology to quantify these risks, identify important trade-offs, and enable objective glide path comparisons across all target date funds.

Choosing a target date fund series has a lot in common with choosing which home to buy: Both decisions can have a big impact on a person's long-term financial success. There are variables to think about when buying a home—price, location, number of bedrooms, and condition of the home, for example—just as there are variables to consider when picking a target date fund series.

But when it comes to having relevant data for comparisons and making a final decision, prospective homebuyers are better off. They can pore over all kinds of pertinent information—like comparable home values, home inspection results, and proximity to good schools and work—to help with their decision-making. But investors trying to choose from among different target date fund series often don't have much useful information to work with. Variables usually used to compare different target date series—to versus through glide paths, active versus passive management, open versus closed architecture, and short-term relative performance—aren't adequate. Although they're simple to understand, these variables don't reveal important information that investors need to know in order to accurately compare potential long-term outcomes and make a well-informed decision about which target date series is the best fit.

What's been missing but needed, we believe, is an objective way to compare the glide paths of different target date series. The glide path plays a crucial role in determining the financial outcome for investors once they retire. Its design requires a critical balancing act between two major risks borne by investors saving for retirement: the risk of not saving enough to last a lifetime (longevity risk) and the risk of a significant loss (market risk), particularly near or in retirement.

To quantify these risks and get at the important trade-offs investors must weigh when selecting a target date series, we've developed a methodology for measuring GPS. This tool uses a simple, intuitive framework designed to balance longevity and market risks and enable objective glide path comparisons across the universe of target date funds.

Popular criteria fall short in evaluating GPS

To versus through glide path. The to versus through glide path debate centers on whether a target date fund's glide path should stop reducing equity exposure at the anticipated retirement date (to retirement) or keep reducing it until some point after retirement (through retirement). We think this focus on overall equity allocation misses a key consideration that affects a glide path's level of risk: the slope of the glide path and its impact on the underlying exposures of the funds.

A steeper glide path slope—in other words, a shorter transition period from highest-risk to lowest-risk equity allocation—can lead to higher sequence-of-return risk (the risk of experiencing negative returns as an investor nears retirement) than a flatter glide path. That's because the negative impact of a significant drawdown close to retirement is compounded by the glide path's steeper slope, with its short transition to a target date fund's most conservative allocation; in effect, the investor is locking in realized losses. A flatter glide path and longer transition period, by comparison, allow more time for an investor to recoup losses before a fund reaches its most conservative allocation.

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Active versus passive management. Many target date fund series are composed mostly (if not completely) of either actively managed or passively managed underlying strategies, which forces investors to choose between the two. We think a better approach strategically pairs the two together because, as Figure 1 shows, active strategies have tended to perform better than passive strategies in certain market environments and vice versa.

Figure 1. Percentile rankings: Actively and passively managed large blend funds (monthly 36-month rolling periods)

Source: Morningstar Direct

Given their tendency to often perform well when the other isn't, active and passive strategies can complement one another within a target date series—creating a product with potentially better attributes than is possible with the either/or approach.

Open versus closed architecture. Target date funds with closed architecture use proprietary strategies within their underlying portfolios, while open architecture target date funds use the strategies of multiple managers, and their glide paths can be customized. Investors weighing the benefits and costs of open versus closed architectures should assess whether the value of having a customized glide path and selecting managers offsets the additional administrative costs for these features.

Within 401(k) plans in particular, it's important to consider whether a plan's demographics differ meaningfully from the standard assumptions used in closed architecture target date funds and whether there's the desire and confidence to select underlying managers. If the answer is yes, then an open architecture approach may be warranted; if not, a closed architecture may be a better fit. For most small and midsize 401(k) plans we've worked with, the choice of open or closed architecture hasn't been a major factor in selecting an appropriate target date series, most likely due to the higher costs and complexity of open architecture funds.

Short-term relative performance. The stated objective of most target date series is to seek long-term capital appreciation before the target retirement date to help investors accumulate enough savings, by the time they retire, to last throughout retirement. Success is determined over a lengthy horizon. But despite the long-term investment objective, there's strong pressure to compare target date funds based on their short-term performance. This has incentivized target date providers to overfocus on short-term results—in a long-term product—in order to avoid weak relative or peer rankings. Given the long-running bull market, the top-performing target date funds over the short term have tended to be those with the highest equity allocations, despite the greater market risk those allocations bring.

There were similar pressures in the run-up to 2008's global financial crisis; target date fund providers competed to outperform one another by taking on more equity risk in an effort to get the best returns. This didn't turn out well. In fact, the target date industry faced heavy scrutiny from investors and regulators following the crisis due to the huge losses incurred by investors in perceived safe vehicles for retirement savings.

Using our homebuying analogy, an investment decision based on short-term performance is akin to buying a home based on a few years' favorable weather data. Does that mean the future will look like the past? It's possible. Do we need more information to make a more accurate assessment? Certainly. For example, is the home in a flood plain? Is it located on a coast frequented by seasonal hurricanes?

These risk criteria for buying a home are analogous to the GPS scoring methodology that Wells Fargo has developed to assess and balance the key risks associated with target date funds. This tool provides a forward-looking lens for objectively evaluating a target date fund's glide path—which plays a crucial role in determining the financial outcome for investors once they retire. While short-term performance and peer group rankings offer insights, they should be considered through the GPS lens to accurately evaluate a target date series' success potential.

GPS scoring methodology: A standardized, objective method for comparing target date glide paths

Comparing preretirement target date glide paths

While most target date series are designed to replace a percentage of final preretirement income, there isn't a universal income-replacement target. The percentage used varies among different target date providers, depending on the assumptions being used—including spending rate, life expectancy, and inflation, among others.

We recognized the need for a tool that eliminates ambiguity and enables investors to make apples-to-apples comparisons of different target date series, and we built the GPS scoring methodology to meet that need. To ensure objective comparisons with GPS, we've defined its target date series' preretirement goal as accumulating enough retirement savings to purchase, at retirement, a hypothetical inflation-adjusted immediate annuity that replaces a specified amount of preretirement income. There's no expectation for retirement savers to actually purchase an immediate annuity contract when they retire. This savings goal is simply a realistic, objective way to quantify a successful retirement income because the annuity calculation takes into account possible fluctuations in inflation and interest rates over time.

GPS uses actual market variables in glide path simulations because doing so enables the construction of a more robust glide path than is possible with Monte Carlo simulations. Most Monte Carlo simulations rely on static capital market assumptions and cross-asset correlations, so they tend to underestimate market risk. For example, people who retire at a time when inflation is higher and economic growth is slower than the static market assumptions have projected could be hit with a double whammy when they've stopped working: lower accumulated savings to live on and higher expenses than they expected. Scenarios like this one can significantly reduce the amount of time their retirement savings will last.

GPS scoring relies on objective calculations. The glide path model used in developing preretirement GPS scores simulates the real wealth accumulation of a typical retirement saver over a 40-year career based on some standard assumptions for a typical retirement saver.[1] This approach ensures that all glide paths are evaluated using the same set of assumptions for an apples-to-apples comparison. These assumptions can be customized, however, to represent a demographic specific to a company or population.

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Figure 2 shows one simulation of an investor's expected accumulations before retirement compared with the savings objective mentioned earlier: the cost of a hypothetical inflation-adjusted immediate annuity that replaces a specified amount of preretirement income. The gap between the forecasted total accumulation and the annuity's cost in this simulation is the investor's surplus, because the wealth accumulation exceeds the savings objective. (If the wealth accumulation had fallen below the savings objective, this simulation would have depicted a shortfall.)

Figure 2. Illustration of one GPS retirement simulation
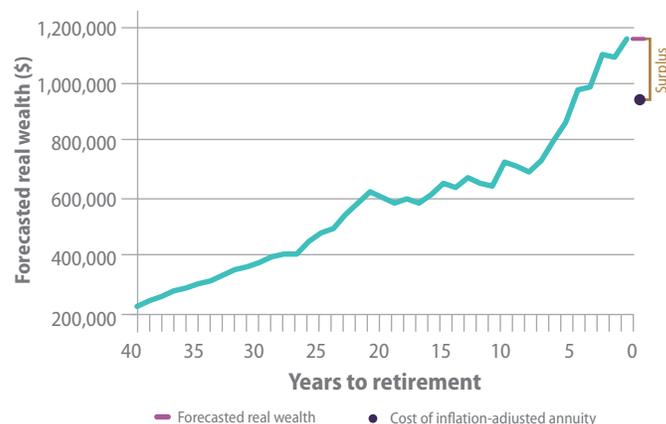
Source: Wells Fargo Asset Management (WFAM)

This simulated wealth accumulation is repeated over 10,000 times—across a range of market cycles—using a bootstrap method that simulates non-normal return distributions by using historical market data adjusted for forward market expectations.[2] This simulation method provides a more realistic representation of how markets actually behave, and it captures the changing cross-asset correlations that can amplify downside risk during market dislocations that occur over time.

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[1] See *Standard Assumptions* in the Appendix
[2] See Appendix for more information on bootstrapping

GPS calculations quantify key risks preretirement glide paths must address. A retirement saver experiences one path toward retirement; there are no do-overs. This makes it crucial for target date providers to thoroughly understand the four key risks target date investors face and address them in glide path development (Figure 3). With this in mind, we designed our GPS scoring methodology to measure how effectively each glide path mitigates each of these risks during investors' asset accumulation years, before retirement.

Figure 3. GPS methodology measures a glide path's ability to mitigate four key risks during investors' preretirement years

Longevity risk

- **ACCUMULATION RISK:**
  The average difference between the forecasted account level at retirement and the cost of a hypothetical inflation-adjusted immediate annuity that replaces a specified amount of preretirement income

- **SHORTFALL RISK:**
  The average shortfall (negative surplus), in the event a shortfall occurs

- **SUCCESS RATE RISK:**
  The probability that a simulated retirement account meets or exceeds the cost of the hypothetical annuity at retirement

- **MARKET RISK:**
  The annual amount at risk, measured across the entire glide path and placing increasing importance on measurements closer to retirement

For every glide path tested, the GPS tool runs 10,000 wealth simulations to calculate its accumulation, shortfall, success rate, and market risks. This process has been repeated over a thousand times for a wide range of possible glide paths, including all off-the-shelf target date glide paths on the market. Figure 4 displays the range of glide paths evaluated.

Figure 4. Range of glide paths tested
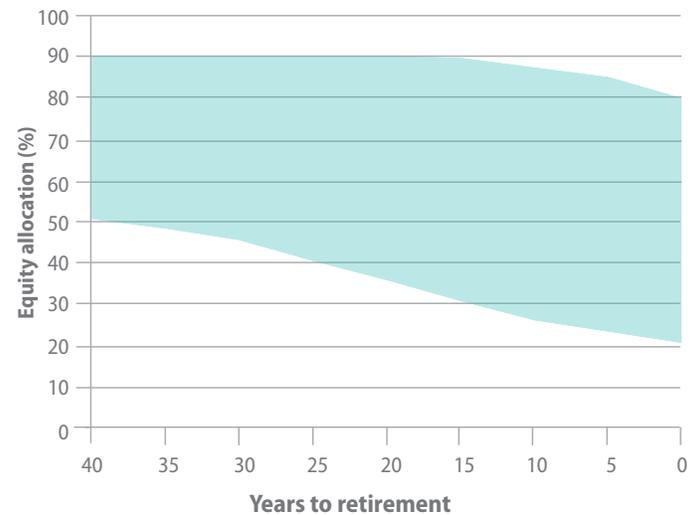
Source: WFAM

A glide path's four risk measurements are compared with the corresponding risk measurements for the total glide path universe, and a z-score is calculated for each risk; the four z-scores for each glide path are referred to as its GPS scores. Higher GPS scores always are preferable to lower GPS scores. More aggressive glide paths tend to have higher accumulation risk and success rate risk GPS scores and lower shortfall risk and market risk GPS scores; GPS scores for more conservative glide paths tend to trend in the opposite direction.

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In Figure 5, which shows the GPS scores for a sample target date glide path, the positive z-scores indicate that this glide path is above the median within the universe of glide paths sampled. The roughly 2.0 shortfall risk z-score indicates that the glide path is near the top 2.5% of glide paths for that risk. Said differently, simulations suggest that when this glide path doesn't meet its objective, it fails to do so by a relatively small amount—placing it in the top 2.5% of all glide paths evaluated.

Figure 5. GPS scores measure longevity and market risks
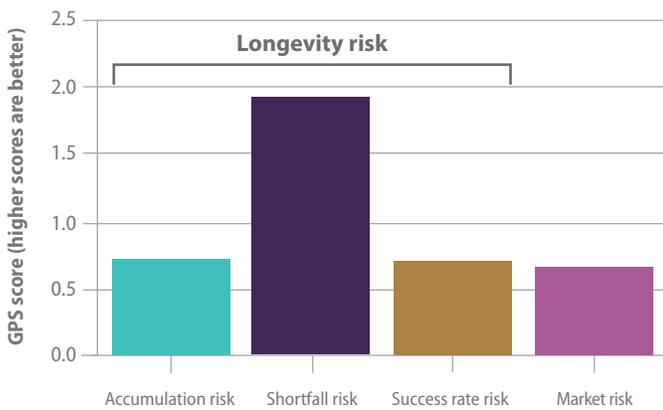
Source: WFAM. The scores for each risk factor are normalized z-scores across the universe of glide paths. For example, a +1 score represents a score in the top 16% of the range of scores achieved by all possible glide paths (a +2 score is in the top 2.5%). Similarly, a score of -1 is in the bottom 16% of the range of scores achieved by all possible glide paths. Scores were calculated via a process that incorporated index returns. You cannot invest directly in an index.

The preretirement GPS scoring framework offers three main advantages:

1 It objectively compares how effectively different glide paths mitigate key risks during investors' asset accumulation years.

2 By focusing on key risks, it enables testing of trade-off decisions—such as improving longevity risk (through higher accumulation, shortfall, and success rate risk scores) versus reducing market risk. Few glide paths score high on all four GPS scores.

3 Demographic assumptions can be customized to help design a glide path that's tailored to the features of a specific group of investors.

Case study: Using GPS scores to compare glide paths of three target date families

In this example, we've used GPS scores to compare the glide paths (Figure 6) and GPS scores (Figure 7) of the Fidelity, BlackRock, and Wells Fargo target date fund families.

Figure 6. Glide paths for three target date series
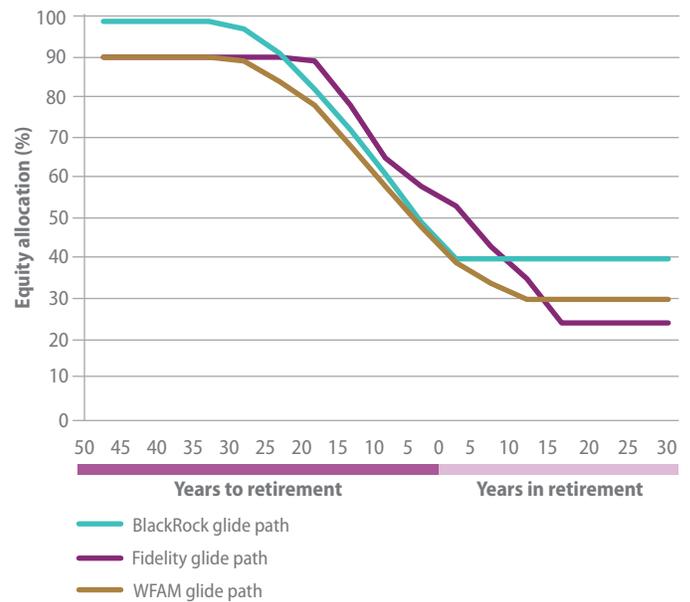
Source: Morningstar Direct; as of December 31, 2017

Figure 7. GPS scores for three target date series
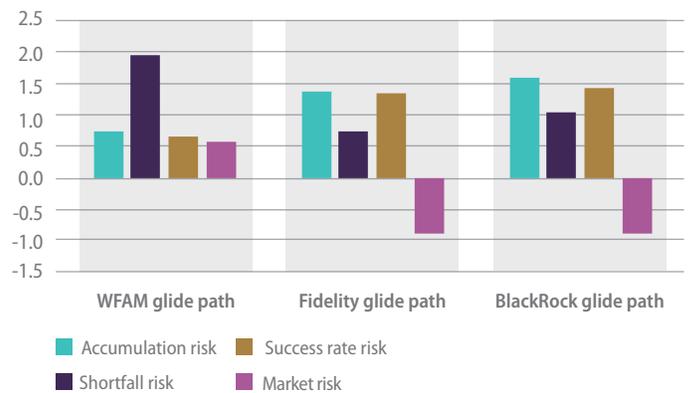
Source: WFAM Multi-Asset Solutions team

A glide path's accumulation, shortfall, and success rate risk scores collectively measure the glide path's effectiveness in addressing longevity risk. The higher equity allocations, in various periods, of the Fidelity and BlackRock glide paths result in relatively strong longevity risk scores compared with the Wells Fargo glide path, at the expense of market risk: The Fidelity and BlackRock glide paths score near the bottom quartile in market risk. This means that while the Fidelity and BlackRock target date fund families have a higher probability of success (success rate risk scores), as measured by the ability to purchase an inflation-adjusted annuity at retirement that replaces 60% of preretirement income (80% with Social Security included), they are in the bottom quartile in terms of exposure to market drawdowns (market risk score), especially near retirement. The Wells Fargo glide path, meanwhile, scores in the top 2.5% of glide paths in minimizing shortfall risk, which means that should investors come up short of their savings goals, the amount of shortfall they experience is projected to be comparatively lower.

The Wells Fargo Target Date Funds are structured to potentially deliver above-average accumulation and success rate GPS scores and below-average shortfall risk and market risk GPS scores.

GPS also can score postretirement glide paths

Different from preretirement, when people are concerned about saving enough money, retirees worry about possibly outliving those savings. For target date investors, this shift means the glide path risks they previously confronted are replaced by new risks as they spend down their assets (Figure 8).

Figure 8. Key glide path risks once investors retire

- **AVERAGE WEALTH REMAINING AT AGE 85:** Money remaining after 20 years of decumulation spending, often used by participants for legacy purposes (gifting to charity or future generations) or to purchase an annuity

- **PROBABILITY OF SHORTFALL:** The probability of running out of assets under a given withdrawal scenario

- **MAGNITUDE OF SHORTFALL:** Measured by the number of months in which a shortfall occurs

Just as is true during the asset accumulation phase of investors' lives, it's crucial for target date fund providers to address these key postretirement glide path risks; retirees don't get a do-over, either.

> Different from preretirement, when people are concerned about saving enough money, retirees worry about possibly outliving those savings. For target date investors, this shift means the glide path risks they previously confronted are replaced by new risks as they spend down their assets.

To evaluate how each glide path fares in reducing these postretirement risks, we start by simulating an investor's postretirement wealth during the spend-down phase using a base-case scenario of a 4.5% annual withdrawal rate and various starting-wealth levels. Then we retest each glide path similarly, using 3.5% and 5.5% annual withdrawal rates.

Using the results of these tests, we follow a similar process as for preretirement by:

1 Comparing each glide path's three decumulation risk measures with the corresponding risk measures for a range of glide paths

2 Quantifying how effectively each glide path mitigates each of the three key risks facing retirees

3 Calculating z-scores for the three risks for each glide path (again, higher z-scores always are better than lower z-scores)

Figure 9 shows postretirement z-scores for a sample glide path.

Figure 9. Postretirement GPS scores
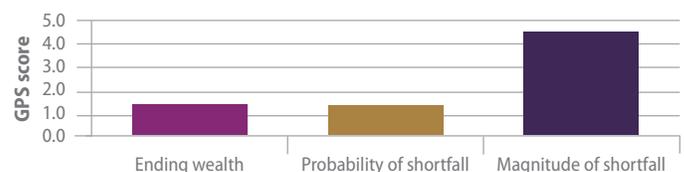
Source: WFAM. The scores for each risk factor are normalized z-scores across the universe of glide paths. For example, a +1 score represents a score that is in the top 16% of the range of scores achieved by all possible glide paths (a +2 score is in the top 2.5%). Similarly, a score of -1 is in the bottom 16% of the range of scores achieved by all possible glide paths. Scores are calculated via a process that incorporates index returns. You cannot invest directly in an index.

The GPS postretirement scoring framework offers three main advantages:

1   It objectively compares how effectively different glide paths mitigate key risks in retirement.

2   It enables testing of postretirement trade-off decisions—such as maximizing age 85 wealth versus the probability of running out of money (and the duration in such an event).

3   Demographic assumptions can be customized to help design a glide path that's tailored to the features of a specific group.

Conclusion

Back to our homebuying analogy: With our GPS scoring framework, there's now a wealth of information to help make a sound purchase decision by considering all of the variables and trade-offs in that purchase. Is one home necessarily better than another? It depends on the buyer's values and risk tolerance. Without relevant data to assess the risks and make informed trade-offs, it's difficult to know which decision would be the best fit.

Similarly, in selecting a target date fund series, it's important to base the decision on objective, easy-to-understand metrics that allow for clear, relevant comparisons of different vendors' glide paths. Our preretirement and postretirement GPS scoring framework provides a simple way to evaluate any target date series, and it enables objective glide path comparisons across the universe of target date funds along the entire course of an investor's retirement journey.

We want to help our clients build for successful outcomes, defend portfolios against uncertainty, and create long-term financial well-being. To discuss your investment needs, please contact us:

- To reach our U.S.-based investment professionals, contact your existing client relations director, or contact us at WFAMInstitutional@wellsfargo.com.

- To reach our U.S.-based intermediary sales professionals, contact your dedicated regional director, or call us at 1-888-877-9275.

- To reach our U.S.-based retirement professionals, contact **Nathaniel Miles**, head of Defined Contribution at Wells Fargo Asset Management, at nathaniel.s.miles@wellsfargo.com.

- To reach our international investment professionals, contact your regional client relations or sales director, or contact **Ben Foley** at either ben.foley@wellsfargo.com or +44 20 7518 2947.

- To discuss environmental, social, and governance (ESG) investing solutions, contact **Jessica Mann**, head of ESG at Wells Fargo Asset Management, at jessica.mann@wellsfargo.com.

Appendix

Standard assumptions.

Savings behavior variable	Savings behavior value
Start working	Age 25
Starting salary	$41,600
Retirement age	Age 65
Life expectancy at age 85	6.72 years
Real salary growth rate	Variable—is higher early in investors' careers but becomes slightly negative as they approach retirement age
Contribution rate	Increased as retirement approaches: age 25–30: 9% age 30–35: 10% age 35–40: 10% age 40–45: 11% age 45–50: 11% age 50–55: 13% age 55–60: 14% age 60–65: 14%
Real annual Social Security payment at retirement	75% of SSA Quick Calculator = $12,222 for median earner
Income replacement rate	80% of preretirement income (including Social Security)

Bootstrap method for simulating returns. It's become common practice to use simulation techniques to forecast future financial outcomes, especially in situations involving uncertain cash flows. Monte Carlo and bootstrapping are two simulation methods we considered.

The Monte Carlo method defines a theoretical return distribution. Normal distributions are commonly used in financial simulations due to their simplicity. The user defines the mean, or expected value, and a standard deviation to describe the variation in asset-class returns. The simulation method then randomly selects from that theoretical distribution to create a time series of returns. This process is repeated several times to create a distribution of potential future outcomes.

However, we've observed that financial market data do not follow a normal distribution, particularly during periods of market stress. In reality, market returns are neither perfectly distributed around a mean nor narrowly bounded as a normal distribution would suggest. Rather, asset returns can be positively or negatively skewed, and extreme *left tail* events (market dislocations) occur with much greater frequency than would be implied by a normal distribution. This makes the Monte Carlo method less useful in financial market applications.

The bootstrapping method addresses much of this issue because it allows for non-normal return distributions. The bootstrap method randomly selects from a distribution of observed market returns to create a time series of returns. For example, a series of 120 randomly selected monthly returns is selected to create a 10-year-long return series (from a 30-year history of market returns). This process is repeated several times to create a distribution of potential future outcomes. We modify the traditional bootstrap method to randomly sample rolling six-month periods. We do this for two reasons:

1 We want to preserve the short-term correlations between stock and bond returns, which can vary substantially. We've observed that during periods of market stress, cross-asset correlations can rise sharply, compounding market losses.

2 We want to preserve the serial correlation observed in capital markets. Serial correlation refers to the tendency for sequential observations in a time series to affect each other, indicative of the market's tendency to revert to its mean.