Key Ideas

• Strategic asset allocation is a key component of long-term investing; nonetheless, equity market drawdowns at inopportune moments can derail the best-laid plans.

• Increasing diversification can help, but ultimately most strategic asset allocation models depend on constant risk and return assumptions which keep them from adapting to market conditions.

• Variable beta strategies can adapt to risk regimes. This allows for static assumptions and allocations, while potentially improving overall portfolio efficiency – a dynamic strategy “inside” a strategic model.

• We illustrate the benefits of using variable beta strategies in strategic asset allocation models by showing their effectiveness within a target date strategy.
Strategic allocations fall short

Along with everyone else, plan participants in target date funds who were two years shy of retirement witnessed a double-digit loss in equity returns during the fourth quarter last year – a small loss compared to downturns seen a decade prior.

In the last three months of 2018, the S&P 500 Index experienced a maximum drawdown of 19.3%. During the same period, participants in 2020 target date funds saw a median loss of 7.1%, capturing 37% of the downside.¹ But it was much worse during the Global Financial Crisis. During that downturn, the S&P 500 Index saw a maximum drawdown of 55.3% while participants in 2010 target date funds experienced a median loss of more than 31%, capturing 57% of the equity market downside.

The smaller downside capture in near-retirement target date funds in 2018, compared to 2008, was partly the result of target date managers increasing their bond allocation by a median of 12% after the 2008 Global Financial Crisis. But shifting to bonds can invite other risks, such as interest rates, credit risk or even longevity risk for plan participants.

Instead, it may be more prudent to maintain a stable overall strategic allocation but incorporate more dynamic equity strategies that can adapt to changes in risk regimes. This approach potentially reduces long-term risk without changing an allocation’s return profile, improving compounding benefits and, in turn, encouraging more disciplined savings behavior.

This paper will examine the challenges portfolio managers face when building strategic asset allocation models, detail the options available to circumvent these challenges, and shed light on models that can adapt to different equity market risk regimes.

Markets change, but do your assumptions?

Risk and return assumptions are a key input to asset allocation models. Asset allocators have the crucial task of selecting risk premia that are applicable for the long term, so they often choose values that are static or at least very slow-moving over time.² These assumptions may be problematic because market returns can vary significantly over shorter periods within a full market cycle.

In certain heightened-risk regimes, investors may be left with unchecked downside risk. Since the level of risk changes over time, it may be prudent to vary equity beta exposure because the consequences can be material. Figure 1 illustrates 3-year rolling returns and volatility for the MSCI All Country World Index.

FIGURE 1
THE OUTLOOK FOR EQUITIES VARIES OVER TIME
MSCI All Country World Index, 1995-2018

Can Strategic Asset Allocations Adapt to Markets?

¹ Source: Morningstar Direct. Includes share classes for all target date 2010 and 2020 mutual funds.

² Nonetheless, there is heterogeneity in estimation methodologies for calculating the equity risk premium, and variation in the final estimates across models.
Common remedies
Can you maintain a stable strategic asset allocation, yet still adapt to the market environment?

This is the challenge for most target date strategies and their providers, who have taken a number of steps in recent years to address this problem. Solutions include the use of alternative assets, low volatility strategies, and even tactical asset allocation.

Since the Global Financial Crisis, many portfolio managers have looked to alternative assets such as absolute return strategies and private equity, but those often come with high fees, liquidity risk, and hidden equity beta. Adding low volatility strategies offers important equity diversification and risk reduction, but these have somewhat static, lower beta exposure and generally don’t participate fully in a market’s upside.

Tactical asset allocation can help navigate these risk regimes, but this introduces market-timing challenges. This approach can also increase implementation costs and raise governance issues.

Creating a solution: variable beta
What if you could reduce the overall risk of equity investing without sacrificing returns? A variable beta strategy seeks to do just that. These types of strategies are designed to adapt automatically to equity risk regimes in order to protect on the downside and participate in the upside. They’re a hybrid of active core and low volatility equity strategies designed to reduce risk exposure when it counts, thus providing better long-term risk-return profiles.

In risk-on environments, the equity beta of a variable beta strategy may be closer to 1, while in risk-off markets the beta adjusts downward, reducing systematic risk as seen in Figure 2. Ideally, adjustments are made in a systematic and disciplined manner to improve consistency and smooth the equity return profile without the requirement for unreliable market-timing decisions.

FIGURE 2
VARIABLE BETA’S HYBRID NATURE SEeks TO ADAPT TO RISK REGIMES
A variable beta strategy can be incorporated into an asset allocation in two different ways. A portfolio manager can reduce the total volatility of a portfolio while maintaining the same equity exposure. Or a manager can maintain the volatility of the portfolio while increasing equity exposure and improving return potential.

Case study: target date funds

We illustrate the benefits of adding a variable beta strategy to an asset allocation model by demonstrating its efficacy in a target date strategy. Target date strategies are a popular choice in defined contribution plans, but they are also limited by their constant risk premia assumptions. These assumptions may result in substantial drawdowns arising from the equity allocation, which reduce compounding benefits and exacerbate poor timing decisions by plan participants. Both have negative long-term return consequences on wealth accumulation.

In what we shall refer to as our “Base Case,” our analysis uses the Morningstar Lifetime Allocation Moderate Index, a robust benchmark for target date strategies. We then create two alternative target date glide path models by substituting some of the equity index portion of the allocation with a hypothetical variable beta strategy.

In the first case, we create the Reduce Volatility (RV) model. Here, we substitute 1/3 of the equity portion with a hypothetical variable beta strategy. Our goal in this model is to reduce portfolio volatility while maintaining the same equity exposure of the Base Case. The impact on volatility is illustrated in Figure 4. It shows a reduction in volatility throughout the glide path while maintaining the same overall equity exposure.

In the second case, we create the Match Volatility (MV) model, where the substitution within equities is the same as in the RV model (i.e., 1/3). Our goal in this model is to match the portfolio volatility and increase the total equity exposure compared to the Base Case. Throughout the glide path, we are able to increase total equity exposure – and corresponding return potential – at the same level of volatility as the Base Case (Figure 5).

FIGURE 3

PERFORMANCE FOR MSCI ACWI AND A HYPOTHETICAL VARIABLE BETA STRATEGY

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</thead>
<tbody>
<tr>
<td></td>
<td>Return</td>
<td>Volatility</td>
<td>Drawdown</td>
<td>Recovery</td>
</tr>
<tr>
<td>MSCI ACWI</td>
<td>7.0%</td>
<td>15.0%</td>
<td>-42.5%</td>
<td>61.1%</td>
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<tr>
<td>Variable Beta Strategy</td>
<td>10.6%</td>
<td>10.4%</td>
<td>-6.5%</td>
<td>87.1%</td>
</tr>
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</table>

A variable beta strategy is large enough to have some impact at the overall fund level, but not too large to alter diversification within the fund.

The full asset history of asset class returns is used to calculate the covariance matrix, and the same matrix is used for each fund (or retirement year); therefore, the change in volatility comes from differences in target date fund weights.

The increase in equity exposure to 100% in the early-career stage creates a bigger gap in volatility between the funds since we cannot increase the equity portion further to achieve the same volatility as the Base Case.
FIGURE 4
REDUCE VOLATILITY (RV) MODEL: REDUCE VOLATILITY AND MATCH EQUITY EXPOSURE

Hypothetical illustration.

FIGURE 5
MATCH VOLATILITY (MV) MODEL: MATCH VOLATILITY AND INCREASE EQUITY EXPOSURE

Hypothetical illustration.
Impact on participant outcomes

To understand the impact of using a variable beta strategy, we examine the cumulative wealth differences between the Base Case, RV and MV models over the 20 years ended December 31, 2018. (See Wealth Impacts Across the Investment Lifecycle).

During the early-career phase, participants have a high allocation to equities. The rationale is that younger participants who experience a down market have more time to regain principal. Mitigating negative returns during this phase helps improve the compounding effect over the first 20 years of a participant’s career. At the end of this period, accumulated wealth for the RV model is 4.9% higher than the Base Case. Wealth for the MV case is 9.8% higher (Figure 6).

Equity exposure begins to fall significantly in most glide paths during the late-career stage. Here downside protection becomes increasingly critical. Mitigating overall portfolio risk and negative returns in this phase is especially important during the years just before retirement when the sequence of returns can dramatically reduce portfolio wealth. A variable beta strategy can help in this stage by reducing the magnitude of negative returns. During this period, the RV model generates 12.9% more wealth and the MV model generates 16.8% more relative to the Base Case model (Figure 7).

Finally, during the in-retirement phase, participants are expected to withdraw capital to live on, but doing so in down markets is especially damaging to portfolio longevity. At the same time, people are living longer in retirement, so maintaining equity exposure is vital. Variable beta can help here too. During this period, wealth for the RV and MV models are 11.7% and 17.0% higher than the Base Case, respectively (Figure 8).
**Wealth Impacts Across the Investment Lifecycle**

Figures 6-8 below show the cumulative wealth impact of adding a hypothetical variable beta strategy to a target date glide path by comparing the Base Case, Reduce Volatility (RV) and Match Volatility (MV) models over three phases of the lifecycle. All three models use the allocations for the Morningstar Lifetime Allocation Moderate index as a starting point. Each asset class is represented by a passive investment, except the RV and MV models substitute 1/3 of the total equity allocation with a hypothetical global variable beta strategy. Contributions and withdrawals are assumed to be monthly, and each target date fund across the lifecycle is rebalanced monthly to allocations which are fixed for five-year periods. All results are gross of fees, includes the reinvestment of dividends and other earnings, and all figures are in nominal terms.  

**Accumulation Stages**

Figures 6 and 7 illustrate cumulative wealth results of the models during the Early-Career and Late-Career accumulation stages. The cumulative growth assumes plan participant contributions based on the historical U.S. median household income and U.S. personal savings rates.  

**Retirement Income**

Figure 8 depicts cumulative wealth results of the models during the In-Retirement stage. It assumes contributions in early years and subsequent monthly withdrawals.  

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1. The common period that all assets have data for is from Jan. 1, 1999 to Dec. 31, 2018 as of end of the analysis.  
2. $150,000 starts in 1999 using monthly contributions of the median household income of U.S. and personal savings rate of 20 years at a 10% annualized nominal return on capital. The data only started in 1984, and we had to extrapolate the data back to 1979 (i.e., for years from 1979 to 1983, we used the same income as 1984, which is $22,415 annually).  
5. $300,000 starting in 1999 is calculated in a similar way to the starting wealth of $150,000 from Late-Career stage, except now it uses a 40 year-history of cumulative investment from savings (dating back to 1959, with extrapolation done when needed). Besides, a 5% annualized nominal return on capital, instead of 10%, over the 40 years is assumed to reflect returns levels of the bond market from different periods in history.  
6. Assumes contributions from 61-65 years old (1999-2003, inclusive), then withdrawals starting at age 66. Cash distributions are based on 80% average salary between age 61-65 (inclusive, from year 1999 to 2003) less social security benefit.
Winning by not losing

By reducing the impact of drawdowns, variable beta strategies offer the potential for improved compounding and can encourage better savings behavior.

The negative impact of downside risk on wealth creation is well-documented; positive and negative returns of the same magnitude do not have the same impact on compound returns. Negative returns are harmful because after a loss, investors have less capital invested and require a positive return greater than the loss to break even.

What’s more, downside risk affects plan participant contribution behavior – even in target date strategies. Risk aversion and anxiety during equity market downturns affect contributions as participants abandon their investment strategies at the worst of times. Selling low and buying high can amplify the negative effect of volatility on wealth outcomes.

Using variable beta strategies can help on both fronts by mitigating the drawdown impact that equities have on a portfolio. In Figure 9, we observe that both models protect on the downside. The RV model exhibited the lowest drawdown in recent equity downturns versus the Base Case and MV models. During “risk on” recovery periods, variable beta strategies attempt to keep up with rising equity markets by systematically increasing beta. It’s worth noting that the MV model captured more upside than the RV model because of its higher equity allocation.

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**FIGURE 9**

DRAWDOWN AND RECOVERY COMPARISON FOR ALL THREE MODELS

<table>
<thead>
<tr>
<th></th>
<th>Tech Bubble</th>
<th>Financial Crisis</th>
<th>2015 - 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drawdown</td>
<td>Recovery</td>
<td>Drawdown</td>
</tr>
<tr>
<td>Base Case</td>
<td>-30.0%</td>
<td>73.5%</td>
<td>-47.4%</td>
</tr>
<tr>
<td>RV Case</td>
<td>-21.6%</td>
<td>76.5%</td>
<td>-40.3%</td>
</tr>
<tr>
<td>MV Case</td>
<td>-26.3%</td>
<td>80.8%</td>
<td>-43.4%</td>
</tr>
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</table>

Hypothetical illustration.
Conclusion

Academics and practitioners alike have long extolled the importance of strategic asset allocation in successful long-term investing. Today’s widespread adoption of target date funds by plan sponsors and participants is a testament to their convictions. Nonetheless, many investors found themselves swept up in recent equity market downturns despite the strong diversification offered by these strategies.

In this paper, we’ve shown a path for potentially changing this investor experience. By using variable beta strategies, portfolio managers can make their strategic asset allocation models more dynamic without changing their long-term risk and return assumptions. Variable beta strategies can adapt to equity market risk regimes within existing allocation approaches.

We used target date allocation models to illustrate how variable beta strategies alter the value proposition of equity allocations. Overall portfolio efficiency improvements are possible because these strategies attempt to mitigate equity market drawdowns while participating in the market’s upside. In turn, participants in target date strategies benefit from the potential of improved compounding effects and volatility reduction that encourages more disciplined savings behavior.
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