Custom versus off-the-lot TDFs:

Choosing the right vehicle for the road to retirement

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Whether it’s a car, a suit, or target-date strategies, consumers are aware that customization can add costs that may or may not outweigh the benefits.

In the case of a car, the base model does the job of getting from point A to point B and meets the needs of most purchasers. But some might want the premium package because the extra comforts are worth it to them. Some might want all-wheel drive depending on where they live or work. Devoted car enthusiasts may not want simple dealer upgrades but to build everything from the ground up. It’s all about how much control they want in the design and detailing.

The same may be said of plan sponsors, who have to weigh the alternatives when it comes to target-date funds (TDFs)—in particular, whether to stick with off-the-shelf products or venture into custom TDFs. And, if the latter, how aggressive do they want to be with the glide path, how much active risk do they take on, and whom do they want at the wheel for their active investments? These are just a few considerations among many in a decision that impacts participants’ retirement nest eggs and sponsors’ fiduciary liability, making this a far more consequential decision than custom detailing a car.

For some plan sponsors, customization of their TDF lineup may be worth the extra cost because of a preference for a specific glide path, active over passive investments, a certain investment manager, or a sub-asset class. Depending on the plan’s unique needs, circumstances, and demographics, each of these factors can have merit and should be evaluated.

Based on years of Vanguard research and hundreds of conversations with our institutional clients, we cover the custom TDF considerations here, from a brief overview of the “three Cs” to a deeper dive into the four factors that influence design.

How Vanguard Institutional Investment Solutions can help

Department of Labor (DOL) guidance in 2013 suggested plan sponsors evaluate custom TDFs in their plan lineups. Since then, conversations have expanded to explore ways to integrate private equity and environmental, social, and governance (ESG) strategy into custom multiasset portfolios. What is the right mix of investments for your custom TDF?

Vanguard Institutional Investment Solutions partners with consultants, plan sponsors, and other institutional clients to navigate the maze of regulatory and investment challenges to help deliver the best outcomes for clients, participants, and fiduciaries. As the world's largest TDF provider* and one of the most trusted names in retirement investment solutions, Vanguard has the scale, experience, and expertise to provide a unique perspective.

To learn more about how Investment Solutions can partner with you, contact your Vanguard representative.

*According to Morningstar data, as of December 31, 2022.

The three Cs in weighing the custom alternative

Defined contribution (DC) plan sponsors considering custom TDFs should weigh the three Cs:

Consolidation: Reducing the number of choices and simplifying naming conventions may make investment menus easier for participants to navigate and improve outcomes.

Control: Plan sponsors may have investment beliefs requiring allocations to certain asset classes or manager strategies that are meaningfully different from standard offers. Customization also gives plan sponsors more control over investment vehicle design that may be better suited for the demographics or risk tolerance among their participants.

Cost: While customization is usually associated with higher cost, that's not always the case, as plan sponsors with significant scale can negotiate lower fees. Lower cost is one of the most powerful tools for the fiduciary working to improve outcomes for participants, who have more to keep and invest when they pay less in fees. Ultimately, plan sponsors must decide how they want to use their "fiduciary budget." A major consideration is the all-in price of customization.

After weighing the three Cs, a plan sponsor may lean toward adopting custom TDFs.

The rest of this paper walks readers through the four primary factors to consider when designing custom TDFs (the "control" aspect of the three Cs), the preferences we've heard from plan sponsors over the years in relation to these considerations, and how their decisions may impact portfolio outcomes.

The four factors we'll cover are:

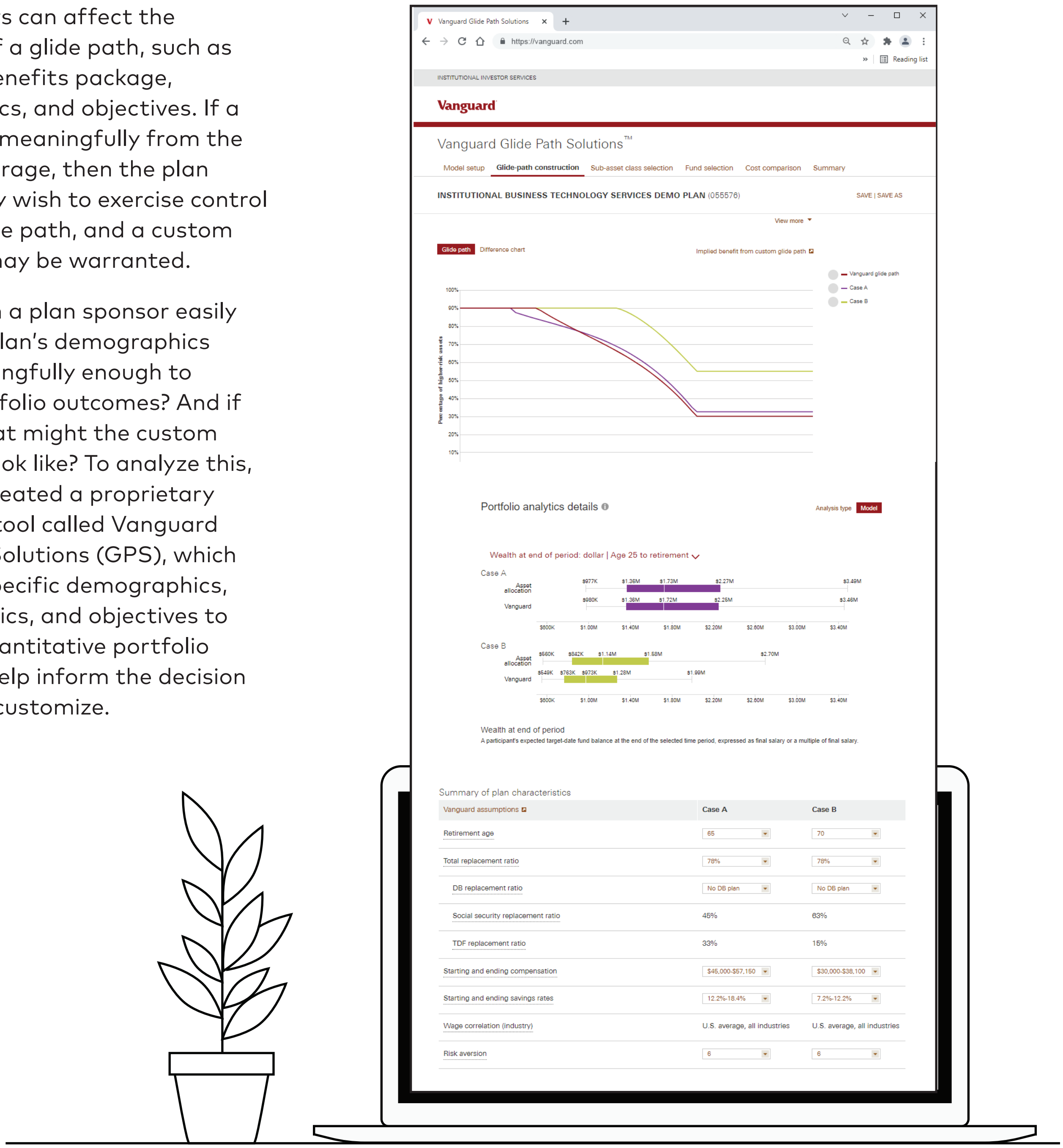
- Customization of the glide path.
- Selection and relative weightings of asset and sub-asset classes.
- Level of active management risk.
- Active manager selection.

Customization of the glide path

TDF glide paths dictate the strategic asset allocation or the ratio between risky assets (equities) and less-risky assets (investment-grade fixed income). Off-the-shelf TDF glide paths are constructed by the TDF provider and are generally designed based on broad, national demographic and plan characteristics.

Many factors can affect the suitability of a glide path, such as the plan's benefits package, demographics, and objectives. If a plan differs meaningfully from the national average, then the plan sponsor may wish to exercise control over the glide path, and a custom glide path may be warranted.

But how can a plan sponsor easily tell if their plan's demographics differ meaningfully enough to impact portfolio outcomes? And if they do, what might the custom glide path look like? To analyze this, Vanguard created a proprietary technology tool called Vanguard Glide Path Solutions (GPS), which uses plan-specific demographics, characteristics, and objectives to generate quantitative portfolio metrics to help inform the decision whether to customize.



For illustrative purposes only.

Case studies: When is it worth changing the glide path?

Within the health care industry, we've found that many companies offer relatively rich, holistic benefits packages. Some continue to offer defined benefit (DB) plan benefits to their participants in addition to a DC plan. DB benefits are part of the total replacement ratio, defined as the percentage of a participant's ending compensation to be replaced in retirement by a combination of Social Security, DB benefits, and TDF savings.

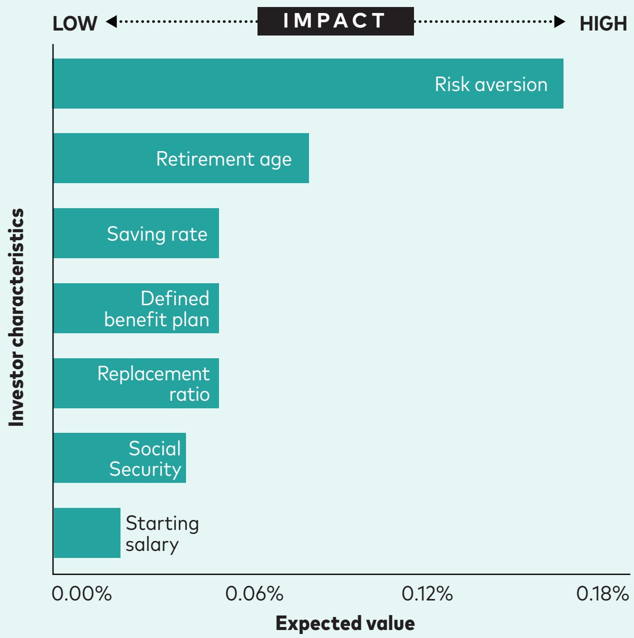
We ran an analysis on one health care company that offered high DB benefits, which we modeled as 30% of their total replacement ratio. One would think that such a large difference in this variable relative to our off-the-shelf TDF—which assumes no DB benefits—suggests that a custom glide path would be warranted. However, keeping the default moderate level of risk aversion in our model, our GPS tool suggests that not enough value would be generated to offset the cost (administrative, advisory fees, etc.) of adopting a custom glide path.

Since a DB plan is an additional source of income in retirement, there is less reliance on the TDF portfolio to generate the wealth needed to meet one's retirement spending needs. An investor could take on less equity risk while still supporting the same standard of living in retirement. But, unless there's a change in risk preferences, there is no benefit to lowering equity risk of the glide path since the probability of success is nearly identical to that of the Vanguard Target Retirement strategy.

The scenario might be different if the participant population had a different risk aversion profile. Investors with low aversion to risk (or higher risk tolerance) would be willing to tolerate higher return volatility to maximize the potential for higher portfolio returns and wealth, resulting in a preference for a glide path with higher equity levels. As shown in the chart above, risk aversion is the investor characteristic with the biggest impact on the glide-path shape. Investors with low risk aversion may be more willing to put up with the higher cost of customization than, for example, investors who want to retire early.

In another case study with a tech company, we assumed a general participant population with low risk aversion, but all other variables were the same as our off-the-shelf TDF.

Quantifying the benefit of customization by investor characteristics



Note: In Vanguard research, the expected value is defined as the "certainty fee equivalent"—the fee that an investor would be willing to pay to be in the optimized custom glide path versus staying with the off-the-shelf glide path. **IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model® (VCMM) regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from VCMM are derived from 10,000 simulations for each modeled asset class. Simulations as of December 31, 2019. Results from the model may vary with each use and over time. For more details, see Important Information at the end of this paper.**

Source: Aliaga-Díaz et al., 2021.

In that scenario, our analysis showed it was worth pursuing customization, as the expected value would have exceeded the cost. That said, for most plan sponsors, it is difficult to make a blanket statement of all participants' risk aversions; thus, we rarely see customization based on the risk aversion variable alone. In the hundreds of GPS analyses we've conducted for clients, the large majority did not result in a meaningful net benefit going with a custom glide path. Expected values, before subtracting out costs, largely trend between 0 and 16 bps, as shown above. Because of this, we rarely see plan sponsors customize the glide path alone; they usually consider other areas of customization as well.

Selection and relative weightings of asset and sub-asset classes

Another consideration for plan sponsors in TDF customization is which asset and sub-asset classes to include or exclude and whether to overweight or underweight a particular asset/sub-asset class.

We believe that index-based TDFs are a great option for plan sponsors, given that index TDFs can provide low-cost, transparent, broadly diversified, market-cap-weighted exposure to almost all areas of the public equities and fixed income markets.

At the same time, we acknowledge that some investors may have different preferences in the asset and/or sub-asset classes within a custom TDF.

Many large plan sponsors in particular have had experience managing investments in their DB plan for decades with tilts to or inclusions of specific asset classes, public or private.

Real estate

An example of this is private real estate, an asset class we have seen some plan sponsors use in their DB plans and one they acknowledge can generate relatively higher capital appreciation and income, albeit with higher risk, than fixed income over long time horizons.

Given their experience with this asset class, these plan sponsors have also included private real estate in their custom TDFs. As a result, some private real estate funds that offer daily net asset value (NAV) and daily liquidity, and are open ended, exist today.

Private equity

Similarly, private equity is an asset class historically used in DB plans but that to date has not been prevalent in DC plans for a variety of reasons including lack of guidance from the DOL on its use. In June of 2020, the DOL released guidance allowing the use of private equity within multiasset portfolios (such as TDFs, both off the shelf and custom) in DC plans.

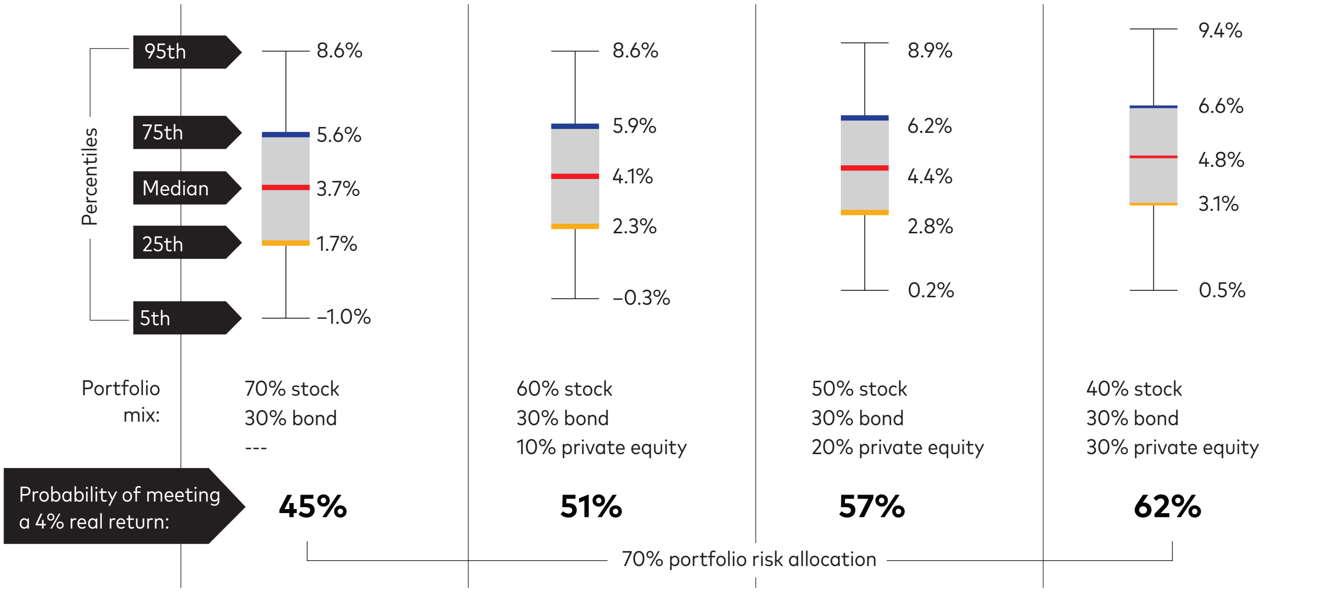
The DOL acknowledged that private equity has historically been limited to only a subset of investors who have been able to benefit from the risk-return characteristics of private equity and that by providing this guidance, it could expand access to Main Street investors.

Similarly, Vanguard believes private equity represents a distinct and growing segment of world equity markets that, because of its significant illiquidity and other market dynamics, offers suitable investors the opportunity to earn long-term excess returns while increasing portfolio diversification (Kinniry et al., 2022).

Private equity investments also entail additional risks relative to public equity, including limited access to high-quality managers, potential illiquidity, and complex investment structures that may be unfamiliar to plan participants and fiduciaries. This research commentary explains Vanguard's approach to private equity.

But controlling for asset classes and expressing preferences through customization doesn't have to be limited to private investments. It can simply include style tilts, such as overweighting real estate investment trusts (REITs) or high-yield bonds, as well as fixed income duration tilts to name a few.

Distribution of expected 10-year real returns[1]



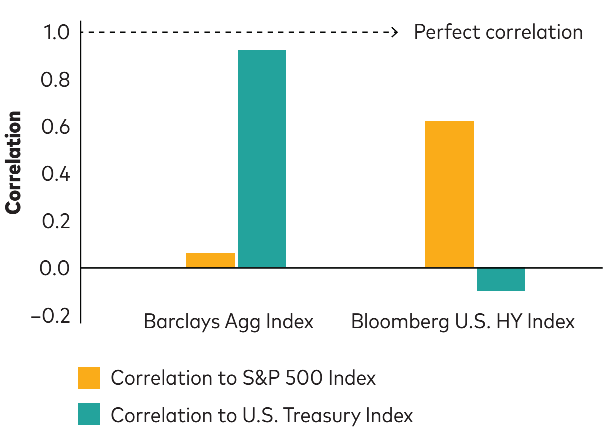
Sources: Portfolio Construction Solutions tool; December 2022 VCMM forecast. For more details, see Important Information at the end of the paper.

High-yield bonds

Take, for example, high-yield bonds, which is a sub-asset class Vanguard decided not to include in our off-the-shelf TDF. We made this decision based on two reasons.

First, high-yield bonds represent about 6% of the taxable U.S. bond market (Bloomberg, 2023). At market weight, an allocation to high yield does not significantly alter the risk-and-return makeup of a broadly diversified portfolio, nor does it significantly impact long-term probabilities of success.

High-yield bond performance is far more correlated to equities than to Treasuries



Second, high-yield bonds exhibit unique characteristics that could classify them as a hybrid asset class. Although debt instruments, their risk-and-return characteristics are more similar to equities because of the default risk associated with the firms and securities that constitute their market. These characteristics increase a balanced portfolio's downside risk during periods of equity market turmoil—exactly when you need your fixed income to provide ballast (Vanguard, 2021).

But for plan sponsors willing to make the fiduciary decision to overweight high yield, accept the elevated default risk associated with high yield, and/or accept lower downside protection for the possibility of higher upside return within fixed income, doing so is reasonable. Those plan sponsors may have achieved relative success using high yield in other contexts or with a particular high-yield active manager.

They could also counterbalance the overweight to high yield with a lower allocation to equities. There are many ways to incorporate a preference for a particular asset or sub-asset class and construct a custom TDF to express these preferences.

←
Source: Vanguard calculations, using FactSet data from January 1991 through December 2022.

Level of active management risk

Once the asset and sub-asset classes are determined, the plan sponsor may choose to control whether some or all exposure to these asset classes should be expressed through passive or active implementation.

Some plan sponsors may see the value of an all-index approach, which provides low-cost, broadly diversified, and transparent exposure; these investors would be well served in an off-the-shelf index-based TDF.

Others believe in active management and its potential to outperform. Even then, we see some plan sponsors include some passive exposure to lower total product costs, increase consistency of returns, and add diversification to the overall portfolio, thereby creating a blended active/passive custom TDF.

Plan sponsors may also believe certain areas of the market are more prime for active management than others. Some may feel it's more desirable to go active in less liquid or smaller markets, such as fixed income or small-cap equities, given wider active manager dispersion in those markets.

Another perspective we've heard is that fixed income markets are fragmented and opaque, with volatile liquidity, providing active managers an opportunity to capitalize on market dislocations and inefficiencies to generate alpha (Jacobson et al., 2019).

It's important to discern which fixed income managers can do this effectively and add value through security selection as opposed to purely overweighting credit and duration, highlighting the importance of a robust manager search and oversight process, which we'll discuss further below.

Once these active/passive preferences are determined, how can we assess their impact on participant outcomes? To demonstrate the quantitative trade-offs of different amounts of active risk taken in a portfolio, Vanguard created the Portfolio Construction Solutions (PCS) tool. The PCS tool can create custom multiasset portfolios in real time using actual client investments to conduct a variety of quantitative investment analyses, including historical performance analysis, risk decomposition, factor attribution, portfolio composition analysis, and forward-looking projections.

The PCS tool can optimize the custom portfolios based on the client's risk aversion to passive, active, and/or factor risk. To generate this output, the tool utilizes our internally developed Vanguard Asset Allocation Model (VAAM). The VAAM uses a number of inputs, including asset return distributions, manager risk, and risk aversion, to determine a suggested mix of active to passive allocations within a specified portfolio. It relies on forward-looking return distributions to assess systematic risk and models the dispersion of active manager returns to assess idiosyncratic risk. It then determines the risk-return tradeoffs of allocations to passive, active, and factors.

The figure to the right shows examples of what the VAAM might produce for a plan sponsor who wants to keep systematic and factor risk constant but take on a different level of alpha risk when it comes to the U.S. equity portion of the portfolio.

These quantitative results can provide valuable inputs into the decision-making process for customizing active risk. For those plan sponsors interested in including and specifying active risk within a custom TDF, there may be value in partnering with a third-party provider, such as Vanguard Institutional Investment Solutions, to talk through the trade-offs of doing so, where in the portfolio to express an active tilt, and the potential portfolio impacts.

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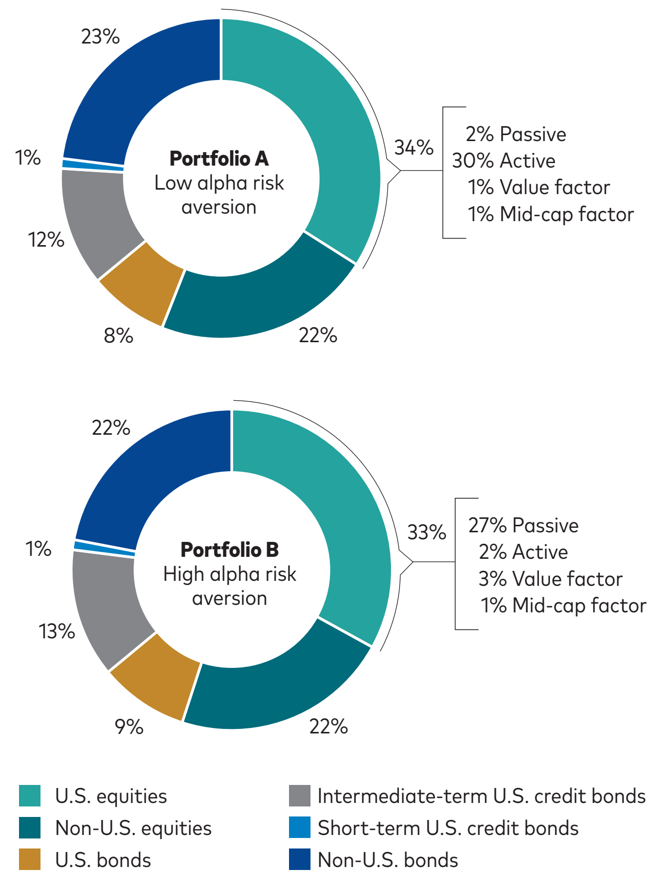
Notes: Portfolios have been optimized over a 10-year investment horizon using U.S. equities, non-U.S. equities, U.S. bonds, non-U.S. bonds, intermediate-term U.S. credit bonds, and short-term U.S. credit bonds. Non-U.S. bonds are hedged to USD. The following constraints apply: non-U.S. equities, up to 40% of the total equity allocation; non-U.S. bonds, up to 50% of total fixed income; total credit bonds, up to 50% of total fixed income; intermediate-term U.S. credit bonds, up to 60% of total credit bonds; short-term U.S. credit bonds, up to 60% of total credit bonds.

Sources: Vanguard calculations, using asset-return projections from the VCMM, as of March 31, 2023.

Changing alpha risk while keeping other risks constant



Case study **RISK AVERSION**	Portfolio A	Portfolio B
Systematic	Medium	Medium
Alpha	Low	High
Factor	Medium	Medium
SUMMARY STATISTICS		
Expected return	6.1%	5.8%
Expected volatility	9.7%	9.2%

Active manager selection

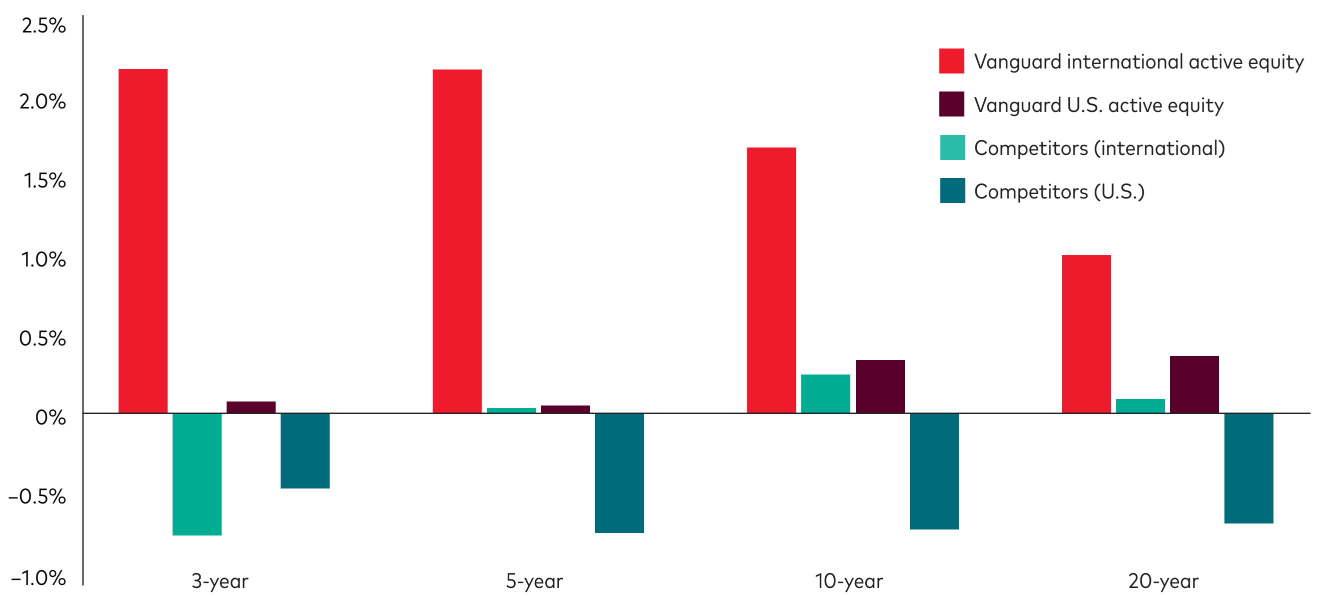
Plan sponsors interested in including active management within custom TDFs will need to decide on the active managers they want to use.

One starting point for plan sponsors is to consider existing actively managed investments in their plan lineup for inclusion in the custom TDF. This is a reasonable starting point because presumably the plan sponsor, working with their consultant, if any, has already approved, conducted due diligence on, and formed a reasonable amount of conviction in those existing funds.

However, at times, the active fund needed to fill an asset class within the custom TDF may not already exist in the plan lineup. Or the plan sponsor may prefer a different style tilt or blend than the existing fund. In these cases, the plan sponsor will need to consider investment manager search, evaluation, and ongoing oversight and will sometimes outsource this activity to an existing consultant or a third-party advisor.

Vanguard has more than 45 years of experience with manager search, evaluation, and oversight. Our dedicated manager and oversight team seeks to identify investment managers who have an active edge and are able to deliver strong, long-term results. We've had success in this sphere.

Actively managed asset-weighted excess returns: Vanguard versus competitors



Notes: Results for other time periods will vary. Note that the competitive performance data shown represent past performance, which is not a guarantee of future results, and that all investments are subject to risks. For the most recent performance, visit our website at institutional.vanguard.com. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

Sources: Vanguard calculations, using data from Morningstar, Inc., as of December 31, 2022.

The performance of each Vanguard and non-Vanguard strategy in the Morningstar database was compared with that of its stated benchmark using monthly return data ended December 31, 2022. The monthly returns for all Vanguard active equity strategies, including those that were merged or liquidated during the period, were included in the performance calculations. The active equity portions of Vanguard balanced strategies were excluded. Annualized asset-weighted excess returns were generated by calculating the asset-weighted cross-section monthly returns and then generating a time series set of returns. All strategy performance data are net of fees in USD. All performance is total return and calculated NAV to NAV. Excess return is the difference between a strategy's NAV total return and the total return of its benchmark index. Results for other time periods will vary.

Manager oversight framework

Here, we share our best practices. Vanguard uses a number of tools to identify manager candidates, including a proprietary database, external databases, and a bench list of external advisors. Each year, we conduct hundreds of meetings with prospective investment advisors from around the world. While many advisors present us with above-average returns and other data, we focus the interview process on a combination of factors listed below.

Firm
We seek firms whose incentives are clearly aligned with the long-term interests of their clients in generating excellent performance, not in gathering assets. They should have the resources, brand, and culture needed to attract and retain a deep pool of top talent.

People
The rise of indexing has coincided with the increased professionalization of the active management industry, leaving behind only the best and brightest. In today's hypercompetitive markets, we strive to partner with the most impressive teams we can find in terms of not only academic credentials but also diversity of background and thought.

Philosophy
Research supports the efficacy of our low-turnover, long-term approach, as well as the merits of strategies with a distinctly contrarian footprint or that are difficult to "factorize." This will only become more important with the proliferation of smart beta exchange-traded funds (ETFs) that offer low-cost, transparent exposure to systematic sources of excess return, such as value and quality.

Process
Increased competition and shifts in the nature of the economy have made it difficult to outperform using simple headline financial metrics such as book value or reported earnings per share (EPS). We believe that proprietary, in-depth research, whether focused on individual stock selection or unique factors for quantitative managers, can continue to add alpha.

Performance
While we have yet to find a single metric that will perfectly predict success, we aim to tip the odds in our favor by focusing on the long term, using the right benchmark, adjusting for risk, and leveraging customized performance attribution approaches that better distinguish between luck and skill.

Conclusion

Vanguard's off-the-shelf TDFs are constructed to best meet the long-term retirement needs for the majority of participants in company plans. But no two plans are the same in demographics or goals, and some plans may deviate far from the national averages so that customization is worth considering.

Plan sponsors and their consultants typically have a detailed and nuanced understanding of the plan's participant population and the history, objectives, uses, and limitations of the investments in their plan lineups. It's reasonable for plan sponsors to have preferences and seek to exercise control around the design of investment vehicles, such as TDFs.

Major elements of control in a custom TDF include the customization of the glide path, the selection and relative weightings of asset and sub-asset classes, the level of active risk, and active manager selection. Each of these elements involves a variety of considerations and trade-offs, and one element may impact another.

We have decades of experience supporting plan sponsors and constructing TDFs. Our insights and quantitative analysis can help in exploring and formulating holistic custom portfolio solutions. Vanguard Investment Solutions is here to help in any way we can to support your investment committee in the evaluation, creation, and implementation of a custom TDF solution.

Most vehicles can get you to your destination, but the destination can vary. And depending on many factors, so can the duration and quality of the ride. Whether a base model or customized, your vehicle should meet your needs and preferences no matter where you are in your journey.

Acknowledgments

This paper includes certain updated analysis to Vanguard research published in 2021 as *Custom versus Off-the-Lot TDFs: Choosing the Right Vehicle for the Road to Retirement* by Michelle Liu, CFA; David Walker, CFA; and Nicole Xu, CFA, CAIA. The current authors thank them for their extensive contributions and original research on this topic.

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Important information

For more information about Vanguard funds, visit vanguard.com or call 800-523-1036 to obtain a prospectus or, if available, a summary prospectus. Investment objectives, risks, charges, expenses, and other important information about a fund are contained in the prospectus; read and consider it carefully before investing.

All investing is subject to risk, including the possible loss of the money you invest. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income. Diversification does not ensure a profit or protect against a loss.

Investments in bonds are subject to interest rate, credit, and inflation risk. High-yield bonds generally have medium- and lower-range credit quality ratings and are therefore subject to a higher level of credit risk than bonds with higher credit quality ratings. U.S. government backing of Treasury or agency securities applies only to the underlying securities and does not prevent share-price fluctuations. Unlike stocks and bonds, U.S. Treasury bills are guaranteed as to the timely payment of principal and interest.

Funds that concentrate on a relatively narrow market sector face the risk of higher share-price volatility.

Investments in Target Retirement Funds are subject to the risks of their underlying funds. The year in the Fund name refers to the approximate year (the target date) when an investor in the Fund would retire and leave the work force. The Fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. The Income Fund has a fixed investment allocation and is designed for investors who are already retired. An investment in a Target Retirement Fund is not guaranteed at any time, including on or after the target date. Investors should check a Target Retirement Fund's prospectus for any applicable expense ratios.

Private investments involve a high degree of risk and, therefore, should be undertaken only by prospective investors capable of evaluating and bearing the risks such an investment represents. Investors in private equity generally must meet certain minimum financial qualifications that may make it unsuitable for specific market participants.

[1]For the distribution of expected 10-year real returns chart, the following indexes were used as asset class proxies: U.S. 3-Month Treasury, Bloomberg Barclays U.S. Aggregate Bond Index, Bloomberg Barclays U.S. High Yield Corporate Bond Index, Bloomberg Barclays USD Emerging Markets Government Bond Index, MSCI U.S. Broad Market Index, MSCI World ex-USA Index, MSCI Emerging Markets Index. For private equity, we used an excess return of 350 basis points over global equities as represented by MSCI All Country World Index, a reasonable proxy for PE returns, based on Vanguard and non-Vanguard research.

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and over time.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The Vanguard Capital Markets Model® is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

Important information (continued)

ESG funds are subject to ESG investment risk, which is the chance that the stocks or bonds screened by the index provider or advisor, as applicable, for ESG criteria generally will underperform the market as a whole or, in the aggregate, will trail returns of other funds screened for ESG criteria. The index provider or advisor's assessment of a company, based on the company's level of involvement in a particular industry or their own ESG criteria, may differ from that of other funds or an investor's assessment of such company. As a result, the companies deemed eligible by the index provider or advisor may not reflect the beliefs and values of any particular investor and may not exhibit positive or favorable ESG characteristics. The evaluation of companies for ESG screening or integration is dependent on the timely and accurate reporting of ESG data by the companies. Successful application of the screens will depend on the index provider or advisor's proper identification and analysis of ESG data. The advisor may not be successful in assessing and identifying companies that have or will have a positive impact or support a given position. In some circumstances, companies could ultimately have a negative or no impact or support of a given position.

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