Vanguard’s approach to target-date funds

Target-date funds (TDFs) are designed to help long-term investors achieve their goals and overcome the challenges of constructing a professionally diversified portfolio. Vanguard TDFs offer a straightforward design coupled with a high degree of transparency, low investment costs, and broad-based exposure to major asset classes.

The issue: Investors saving for retirement need to establish a well-diversified portfolio while assuming an appropriate level of risk at each stage of the life cycle.

The challenge: Given the overwhelming number of investments available and investors’ need to periodically rebalance their portfolios, even a motivated retirement saver may make portfolio errors or fail to manage his or her portfolio strategy effectively over time.

Vanguard conclusion: Vanguard TDFs simplify retirement investing by providing professionally constructed portfolios based on a number of investment best practices—the principles of asset allocation, diversification, transparency—and maintaining a balance among risk, return, and cost.

Use of target-date funds in employer-sponsored and individual retirement plans has expanded dramatically over the past ten years—and for good reason. TDFs can help investors create well-diversified portfolios—critical to achieving retirement readiness—while simplifying the investment process over the long term. TDFs can also provide a sensible default investment option that plan sponsors can use along with plan-design strategies to improve participant portfolios’ diversification, enrollment, and savings rates.

TDFs are designed to address a particular challenge facing many retirement investors: that of constructing a professionally diversified portfolio. As academic and Vanguard research indicates, many investors lack time or interest when it comes to investment or retirement planning.¹ Even a motivated retirement saver may make portfolio errors or fail to manage the portfolio’s strategy effectively over time. TDFs address these challenges by simplifying the asset allocation decision for the investor. After an investor decides in favor of a TDF, subsequent decisions about portfolio construction and life-cycle rebalancing are delegated to the fund’s portfolio manager.

Glide-path construction approach
A portfolio’s asset allocation—the percentage of a portfolio invested in various asset classes such as stocks, bonds, and cash investments—is the most important determinant of the return variability and long-term performance of a broadly diversified portfolio engaging in limited market-timing (Davis, Kinniry, and Sheay, 2007; Brinson, Hood, and Beebower, 1986).

¹ For a more detailed discussion of these issues, see Utkus and Young (2004 and 2009) and Choi et al. (2006).

Note: This article is adapted from a 2012 Vanguard research article by the same title; available at vanguard.com/tdfapproach.
Tactical asset allocation is a type of dynamic asset allocation that actively and systematically adjusts the strategic portfolio mix of an entire TDF allocation based on relative short- to intermediate-term market conditions. Such an approach attempts to add value beyond that of a baseline strategic asset allocation by altering systematic risk factors and overweighting asset classes that are expected to outperform on a relative risk-adjusted basis in the near term. For a more detailed discussion of these issues, see Stockton and Shtekhman (2010).

For more in-depth discussions of these issues, see Bennyhoff (2008) and Ameriks, Hess, and Donaldson (2008).

There have also been some academic attempts to determine an appropriate glide path based solely on the specification of investor preferences, and a variety of assumptions about capital markets and labor income patterns, using sophisticated modeling techniques. See, for example, Viceira (2001) and Gomes and Kotlikoff (2008); Vanguard has also conducted similar internal exercises.

Notes on risk: Investments in target-date 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. An investment in a target-date fund is not guaranteed at any time, including on or after the target date.

Important: The projections or 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. The asset-return distributions shown in this article are drawn from 10,000 VCMM simulations based on market data and other information available as of December 31, 2011. 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. For more information on the VCMM, please see page 7.
their assets immediately? Because historical evidence suggests that only a minority of participants begin to draw down their accumulated savings in the early years of retirement, we believe the TDF design should take this into account. Also, we believe the portfolio objectives for TDFs both at and in retirement should balance current income with the potential for capital growth. Although specific equity allocations around retirement are still a matter for investment debate, there is little research to support the notion that all TDFs should be designed to take participants exactly to retirement, with an immediate income or withdrawal stream beginning at that point.

As part of evaluating and identifying an appropriate glide path, we examined various financial simulations using the Vanguard Capital Markets Model®, a proprietary financial simulation tool, to evaluate different risk–reward scenarios. This included evaluating a number of wealth accumulation and retirement-income-sufficiency scenarios. (See pages 2 and 7, for further description of the Vanguard Capital Markets Model.) We also evaluated glide-path scenarios using sophisticated modeling techniques that are based solely on the specification of various investor preferences and a variety of assumptions about capital markets and labor-income patterns. Each of these modeling exercises provided results that we believe meet the needs of long-term investors.

Finally, we also analyzed actual Vanguard investor behavior data to support Vanguard’s recommendations about appropriate risk levels across the glide path. For instance, we examined the results of a 2010 survey given to Vanguard TDF investors about their risk tolerance and other key investor characteristics and attitudes that are used to derive a suggested overall asset allocation. The survey results showed that the average equity allocation proposed to the survey respondents is consistent with the Vanguard glide path.

Sub-asset allocation of the glide path: Diversifying within the major asset classes

Once the allocation among stocks and bonds across the life of the portfolio has been determined, the focus turns to sub-asset allocation—how to allocate across various types of stocks and bonds. For broadly diversified, balanced portfolios such as the Vanguard TDFs, exposure across all key sub-asset classes means the investor will always be able to participate in some of the stronger-performing sectors while also mitigating the negative impact of weaker-performing ones.
The level of equity exposure and the rate of change in that exposure as the investor ages are the most recognizable components of risk in TDFs and their most significant drivers of long-term performance. However, over shorter periods, performance differentials can stem not only from differences in the portfolio’s broad asset allocations but also from the portfolio’s relative allocation to sub-asset classes within stocks and bonds (Cole, Kinniry, and Donaldson, 2009). It’s important for plan sponsors and investors to be aware of the trade-offs associated with these various sub-allocations.

**U.S. equity allocations**

The U.S. equity allocation within the Vanguard TDF portfolios is weighted according to prevailing market capitalization. This means that the investor will always have exposure to all segments of the broad U.S. stock market (large-, mid-, and small-cap stocks; growth and value stocks) in the exact proportions in which they are represented in the market.

A market-cap-weighted index reflects the consensus estimation of each company’s value at any given moment. In any efficient market, new information affects the price of one or more securities and is reflected instantaneously in an index via the change in market capitalization. Because current prices (and, hence, company values) are set based on current and expected events, market-cap-weighted indexes represent the expected, theoretically mean-variance-efficient portfolio of securities in a given asset class (Philips, 2012).

Vanguard does not maintain a separate allocation to real estate investment trusts (REITs) within the TDFs. However, to the extent that REITs are part of the global equity portfolio, Vanguard includes exposure to REITs as part of the U.S. and non-U.S. equity allocations at their market weight.\(^5\)

**International equity allocations**

International stocks currently account for 30% of Vanguard TDFs’ total equity allocation. Although financial theory dictates that an upper limit for the representation of international equities should be based on their global market capitalization (currently about 58%), our research has shown that international allocations exceeding 40% have not historically added significant additional diversification benefits, particularly after accounting for costs. However, allocations between 20% and 40% historically have achieved most of the maximum diversification benefit. International allocations in this range offer a greater balance among the benefits of diversification, the risks of currency volatility and higher correlations, investor preferences, and costs, considering the targeted TDF audience. Within Vanguard TDFs, international stocks are represented by an index fund that seeks to track the performance of a benchmark index that measures the investment return of stocks in the developed and emerging markets, excluding the United States.

**U.S. fixed income allocations**

We also follow a market-proportional approach within the U.S. nominal investment-grade bond market to match its risk-and-return characteristics as an investor approaches retirement. We focus this allocation on nominal U.S. investment-grade bonds to provide diversification to the primary risk of a sizable equity exposure. High-yield bonds are not included in the allocation, because they represent a small portion of the taxable U.S. bond market, and, at market weight, high-yield bonds would not significantly alter the risk and return makeup of a broadly diversified portfolio.

Although inflation risk is prevalent throughout an investor’s life cycle, it’s primarily in the later stages that investors must focus on investment tools to provide some protection. This is because, for investors in the accumulation stage, inflation protection can be effectively provided from salaries and higher real-returning assets, such as equities. But once in retirement, it’s much more difficult to add to a portfolio through additional earnings. As a result, investors must balance the need for preservation of capital through bonds with the need to maintain purchasing power. Given that inflation-protected securities adjust to changes in inflation quickly by providing inflation-adjusted increases in both principal value and interest payments, they are an appropriate substitute for a portion of the portfolio’s equity allocation during retirement.\(^6\)

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\(^5\) For an empirical analysis of REITs, see Philips, Walker, and Zilbering (2011).

\(^6\) More precisely, the Treasury Inflation-Protected Securities (TIPS) inflation adjustment, or “accrual,” occurs with an indexation lag to the non-seasonally adjusted U.S. City Average All-Items CPI (Consumer Price Index), calculated by the U.S. Bureau of Labor Statistics. Since TIPS’ principal is adjusted to CPI changes, it responds to both inflation and deflation, but with a floor at the par value of the TIPS. Since the interest rate is applied to the principal, both principal and coupon payments are effectively indexed to the CPI. For details, see Gürkaynak, Sack, and Wright (2008).
Vanguard’s current investment methodology recommends the introduction of Treasury Inflation-Protected Securities (TIPS) in portfolios beginning about five years before retirement. Vanguard research shows that shorter-term TIPS have historically displayed a higher correlation to realized inflation with less duration risk than longer-term TIPS. Consequently, Vanguard announced in February 2013 that it will replace the current broad-market TIPS exposure in Vanguard’s near-dated TDFs (Vanguard Target Retirement Income Fund and the 2010 and 2015 Funds) with a shorter-duration TIPS index fund. The final allocation to TIPS will represent 30% of U.S. fixed income, amounting to 16.8% of the total portfolio. This will provide investors with a stronger inflation hedge and less duration risk—albeit at the cost of somewhat lower total expected returns. The primary purpose of TIPS in the near-dated funds is to provide inflation protection for investors, not to boost returns.

**Hedged international fixed income allocation**

Vanguard also recently announced that 20% of the Vanguard TDF fixed income allocation will be allocated to hedged international fixed income. Vanguard has always believed that within the major asset classes, the theoretically ideal baseline investment portfolio for an investor is the market portfolio, which consists of all investable securities in proportion to their relative market values. Although international bonds have long been a significant part of the global market portfolio, practical challenges have historically prevented their widespread use by investors. Typically these markets have been illiquid, costly, and difficult to navigate. However, in the first decade of the 2000s, globalization accelerated with increased access to information and widespread growth of debt issuance. The net result has been a near doubling of the relative weight of the non-U.S. bond market, to the point that international fixed income today is the largest asset class in the investable universe, representing more than one-third of the global liquid market portfolio. Vanguard research suggests that a strategic allocation to hedged international bonds can further moderate risk in a diversified portfolio. Accordingly, this asset class is being added to our TDFs in the belief that it can potentially have long-term diversification benefits for shareholders.

**Cash-reserves allocation**

Along with the other recently announced changes to Vanguard TDFs, Vanguard will be eliminating exposure to Vanguard Prime Money Market Fund in the TDFs for investors who are assumed to have reached age 65. Previous to this change, the primary reason for exposure to money markets in the near-dated funds was to dampen volatility. However, the shift in allocation from longer-duration to shorter-duration TIPS has offset the need for a cash allocation, making the money market holdings to some degree redundant in the overall portfolio.

**Key implementation considerations**

**Active versus indexing**

Whether to use active management or a passive, indexed approach is an age-old decision for investment professionals. Indexing offers broad diversification, low costs, marketlike returns, and transparency, and has been instrumental in reducing surprises and controlling risk. Costs are one of the few variables investors can control, and that cost advantage is especially important for TDFs (particularly those that function as a plan-qualified default investment alternative [QDIA]). In constructing Vanguard TDFs, we strongly believe that any risks investors bear should be expected to produce a compensating return over time. Modern financial theory and years of financial practice have led us to conclude that diversified, broad-based index exposures are precisely this kind of compensated risk. Although some active managers can add value at least some of the time, outperformance cannot be guaranteed.

From a structural standpoint, index funds provide transparent investment options that result in high efficiency and broad diversification. Index funds can also offer plan sponsors and individual investors a strategy that can work over the long term, without the need to continually monitor performance and make changes because of capacity constraints, manager turnover, or loss of confidence in a manager.
Conclusion

Target-date funds offer a portfolio created specifically for retirement investors. Vanguard TDFs are a result of combining capital markets and portfolio construction research with our vast practical experience with investors to offer a diversified, professionally managed portfolio with automatic rebalancing at a low cost. Straightforward design and transparency, emphasizing an index-focused approach that keeps investment costs low, coupled with broad-based exposure to major asset classes, can maximize the usefulness of these funds for investors.

References


About the Vanguard Capital Markets Model

The Vanguard Capital Markets Model (VCMM) is a proprietary financial simulation tool developed and maintained by Vanguard’s Investment Strategy Group. The VCMM uses a statistical analysis of historical data for interest rates, inflation, and other risk factors for global equities, fixed income, and commodity markets to generate forward-looking distributions of expected long-term returns.

The VCMM is grounded in the empirical view that the returns of various asset classes reflect the compensation investors receive for bearing different types of systematic risk (or beta). Using a long span of historical monthly data, the VCMM estimates a dynamic statistical relationship among global risk factors and asset returns. Based on these calculations, the model uses regression-based Monte Carlo simulation methods to project relationships in the future. By explicitly accounting for important initial market conditions when generating its return distributions, the VCMM framework departs fundamentally from more basic Monte Carlo simulation techniques found in certain financial software.

The primary value of the VCMM is in its application to analyzing potential client portfolios. VCMM asset-class forecasts—comprising distributions of expected returns, volatilities, and correlations—are key to the evaluation of potential downside risks, various risk-and-return trade-offs, and diversification benefits of various asset classes. Although central tendencies are generated in any return distribution, Vanguard stresses that focusing on the full range of potential outcomes for the assets considered, such as the data presented in these articles, is the most effective way to use VCMM output.

The VCMM seeks to represent the uncertainty of the forecast by generating a wide range of potential outcomes. It is important to recognize that the VCMM does not impose “normality” on the return distributions but, rather, is influenced by the so-called fat tails and skewness in the empirical distribution of modeled asset-class returns. Within the range of outcomes, individual experiences can be quite different, underscoring the varied nature of potential future paths.
Notes about risk and performance data: All investments, including a portfolio’s current and future holdings, are subject to risk, including the possible loss of the money you invest. Past performance is no guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index. There may be other material differences between products that must be considered prior to investing. Diversification does not ensure a profit or protect against a loss in a declining market. 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. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. Investments in stocks or bonds issued by non-U.S. companies are subject to risks including country/regional risk, which is the chance that political upheaval, financial troubles, or natural disasters will adversely affect the value of securities issued by companies in foreign countries or regions; and currency risk, which is the chance that the value of a foreign investment, measured in U.S. dollars, will decrease because of unfavorable changes in currency exchange rates. Bond funds are subject to the risk that an issuer will fail to make payments on time, and that bond prices will decline because of rising interest rates or negative perceptions of an issuer’s ability to make payments.

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For more information about Vanguard funds, visit institutional.vanguard.com, or call 800-523-1036, to obtain a 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.

An investment in a money market fund is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although a money market fund seeks to preserve the value of your investment at $1 per share, it is possible to lose money by investing in such a fund.

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. While U.S. Treasury or government-agency securities provide substantial protection against credit risk, they do not protect investors against price changes due to changing interest rates. U.S. government backing of Treasury or agency securities applies only to the underlying securities and does not prevent share-price fluctuations. Investments that concentrate on a relatively narrow market sector face the risk of higher share-price volatility. In a diversified portfolio, gains from some investments may help offset losses from others.