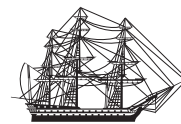


Target-Date Funds: Looking Beyond the Glide Path in 2008

Vanguard Investment Counseling & Research



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Executive summary. In recent years, target-date funds (TDFs) have become an increasingly popular option for retirement investors. The funds are designed to automatically adjust an investor's asset allocation and risk exposure as the investor approaches retirement. This is accomplished by systematically reducing a portfolio's equity exposure over time according to a predetermined schedule, or *glide path*, and replacing these investments with more conservative, less volatile asset classes such as nominal bonds, inflation-protected securities, and cash. The glide path dictates at what ages, and to what extent, the asset allocation is modified, in effect transferring the onus of portfolio management and rebalancing to a professional money manager.

Currently in the financial services industry there is no universally accepted glide path for these funds. This lack of consensus became particularly evident in the market downturn of 2008 as TDFs from a number of providers with the same target date posted noticeably different returns. This paper outlines some target-date methodologies across providers, highlighting different risks associated with the various strategies and illustrating the impact of those strategies on TDFs' performance over both a longer period as well as a shorter, more volatile, period like that of 2008.¹

Authors

C. William Cole
Francis M. Kinniry Jr., CFA
Scott J. Donaldson, CFA, CFP[®]

¹ Note: All returns and asset-allocation data for TDFs in this paper's figures are from Morningstar, Inc., as of December 31, 2008.

Varied TDF strategies, varied results

In constructing a target-date fund glide path, investment providers differentiate their portfolios in three ways, each of which contributes to the funds' relative performance. TDFs vary in their broad asset allocation, in their sub-asset allocation of the broader asset classes, and in their implementation strategy.

It is well documented that asset allocation is the most important determinant in explaining the return variation for broadly diversified portfolios over long periods (for a recent discussion, see Davis, Kinniry, and Sheay, 2007). Typically, the higher a fund's exposure to stocks, the more aggressive we can assume the fund to be, and the higher a fund's exposure to bonds and cash, the more conservative we can assume it to be. Historically, from 1926 through 2008, the broad U.S. stock market returned 9.65% annually, and the overall U.S. bond market returned 5.51% annually, creating an equity-return premium of 4.14%.² For the same period, the 20-year return for stocks was higher than that for bonds in 61 of 64 years, or 95% of the time.³ Since expectations of higher returns come with higher risk, it makes sense that portfolios that are more aggressive can potentially yield higher returns and greater wealth for investors over longer time frames.⁴ However, to realize these long-term benefits, investors must be willing and able to withstand short-term periods of potentially high volatility, periods such as occurred in 2008.

Among TDF providers, there is no universally accepted process for establishing an optimal glide path: More quantitative, probabilistic frameworks generally have higher equity exposures, based on long-term expected returns, whereas frameworks that admit less risk and focus more on downside protection can be expected to have greater exposure

to fixed income securities. As such, much depends on the professional judgment of the individual investment provider—which is why TDF asset allocations vary from provider to provider and why the funds have posted a range of returns in recent years. **Figure 1** highlights sample asset allocations of four TDF providers, each of which used proprietary methodologies to construct target-date portfolios as of December 31, 2008.

Given the research findings on the importance of asset allocation in explaining variation in long-run returns (e.g., Davis et al., 2007), one should expect somewhat longer-term differences in results to be driven largely by variations in the portfolios' broad asset allocations. As shown in **Figure 2**, the three-year return differentials between each fund, by provider, ranged from 3 to 5 percentage points. Generally, for a given target date, funds with higher equity allocations underperformed those with more conservative allocations—normally a counterintuitive finding, but attributable in this instance to the market environment of 2008.

Over a shorter time horizon, however, funds with similar asset allocations posted a wide range of returns. For example, **Figure 3** shows that the one-year (2008) return for the 2025 Fund from Provider B was –36% (78% equity allocation), while the one-year return for the 2025 Fund from Provider D was –30% (77% equity allocation). Likewise, for the same period, the more conservative 2015 Fund from Provider B returned –30% (64% equity allocation), while the 2015 Fund from Provider D returned –24% (63% equity allocation). Such return differentials imply additional, potentially significant, differences in the composition of the portfolios at the sub-asset class level and/or in the implementation strategy used to construct these portfolios.

2 All returns are nominal. Stocks represented by the Standard & Poor's 500 Index, 1926 through 1970; the Dow Jones Wilshire 5000 Composite Index, 1971 through April 22, 2005; and the MSCI® US Broad Market Index thereafter. Bonds represented by the S&P High Grade Corporate Index, 1926 through 1968; the Citigroup High Grade Index, 1969 through 1972; the Lehman Brothers U.S. Long Credit AA Index, 1973 through 1975; and the Barclays Capital U.S. Aggregate Bond Index thereafter. Equity return premium equals the annualized return of a 100% stock portfolio minus the annualized return of a 100% bond portfolio.

3 Calculation uses annualized, year-end returns; the first 20-year return available was for the period ended December 31, 1945. Analysis was conducted through the end of calendar 2008, creating sixty-four 20-year returns.

4 This is not to suggest that historical returns are indicative of future returns, but to highlight that, absent philosophical or structural shifts in the financial markets, the rationale for risk premiums and the historical relationships between asset classes can reasonably be expected to continue in the future.

Figure 1. Sample asset allocations of TDFs from four providers

	Retirement Fund		2015 Fund		2025 Fund		2035 Fund	
	Stock	Bond	Stock	Bond	Stock	Bond	Stock	Bond
Provider A	47%	46%	71%	26%	84%	12%	92%	5%
Provider B	39	48	64	28	78	15	86	8
Provider C	40	55	61	37	77	21	90	9
Provider D	31	63	63	36	77	22	89	10

Notes: Data for all figures in this paper are as of December 31, 2008. Figures 1–3 and 5–6 use data from the same four providers. The “Retirement Fund,” sometimes called a target-date “income fund,” is the fund with the most conservative asset allocation, and is intended to help carry investors through their retirement years. In Figure 1, stock and bond allocations do not add to 100%, because certain funds maintained small allocations to nontraditional asset classes such as commodities and real estate investment trusts (REITs).

Figure 2. Sample three-year annualized TDF returns of four providers, compared with their equity exposures

	Retirement Fund		2015 Fund		2025 Fund		2035 Fund	
	Return	Stock allocation	Return	Stock allocation	Return	Stock allocation	Return	Stock allocation
Provider A	–4%	47%	–8%	71%	–10%	84%	–10%	92%
Provider B	–2	39	–5	64	–8	78	–9	86
Provider C	—	40	–4	61	–7	77	–9	90
Provider D	1	31	–3	63	–5	77	–7	89

Note: The three-year return for Provider C, “Retirement Fund,” was not available, since the fund’s inception date was November 30, 2007.

Figure 3. Sample one-year TDF returns of four providers, compared with their equity exposures

	Retirement Fund		2015 Fund		2025 Fund		2035 Fund	
	Return	Stock allocation	Return	Stock allocation	Return	Stock allocation	Return	Stock allocation
Provider A	–26%	47%	–36%	71%	–40%	84%	–41%	92%
Provider B	–18	39	–30	64	–36	78	–39	86
Provider C	–17	40	–27	61	–33	77	–38	90
Provider D	–11	31	–24	63	–30	77	–35	89

Notes on risk: 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.

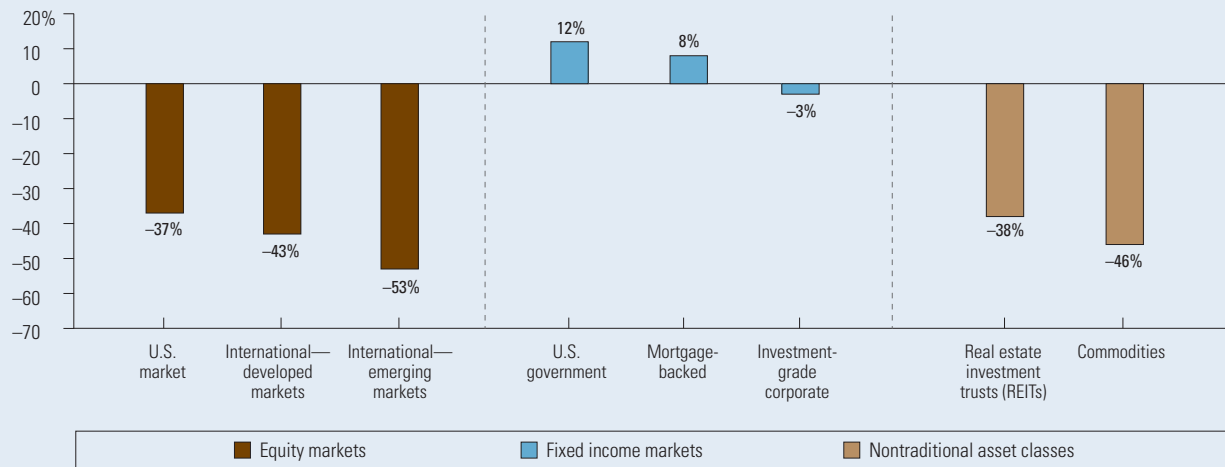
Investments in bond funds are subject to interest rate, credit, and inflation risk. Target-date funds are subject to the risks associated with their underlying funds. Prices of mid- and small-cap stocks often fluctuate more than those of large-company stocks. Diversification does not ensure a profit or protect against a loss in a declining market.

**Differences in TDF performance:
What really matters?**

In evaluating the performance of TDFs from different providers, it is important to consider each glide path's underlying asset classes and the extent of exposure to each. Nontraditional and alternative asset classes, such as real estate investment trusts (REITs) and commodities, have captured much attention in recent years for the potential diversification benefit they can

offer a portfolio. However, the vast majority of TDF portfolios are heavily invested in traditional stock and bond asset classes (see Figure 1). Therefore, when evaluating performance differentials for various TDF providers, understanding the composition of the portfolio's more dominant asset classes is likely more important than isolating the potential impact of a smaller allocation to nontraditional asset classes.⁵

Figure 4. Sub-asset-class returns: 2008



Source: Vanguard.

Notes: Asset-class returns in this figure are represented by the following: U.S. stocks, MSCI US Broad Market Index; international—developed markets stocks, MSCI EAFE Index; international—emerging markets stocks, MSCI Emerging Markets Index; REITs, NAREIT Index; commodities, S&P GSCI Index; investment-grade corporate bonds, Barclays Capital U.S. Credit Bond Index; U.S. government bonds, Barclays Capital U.S. Government Bond Index; mortgage-backed bonds, Barclays Capital U.S. Mortgage-Backed Securities (MBS) Index. For further discussion of the market events of 2008, see Kinniry, Bennyhoff, and Philips (2009).

⁵ Plan sponsors seeking to extend the glide path of their TDFs beyond the traditional asset classes need to understand both the rationale for including alternative asset classes as well as the potential risk and costs that alternatives can add to a portfolio. For further discussion on evaluating target-date strategies, see Hess, Ameriks, and Donaldson (2008).

Sub-asset allocation can make a difference over a short period

A portfolio's *sub-asset allocation*—the makeup of its broader asset classes—refers in equities, for example, to the relative weighting to U.S. stocks versus international stocks; and, in bonds, for example, to relative weightings to corporate, mortgage-backed, and U.S. government bonds.⁶ In 2008, these differences had a significant impact on the one-year TDF returns as returns at the sub-asset class level diverged markedly (see **Figure 4**).

A closer look at the equity allocations

In 2008, losses realized in the equity portfolios of TDFs were magnified with larger international allocations, as both developed and emerging international markets lagged the U.S. stock market by 6 and 16 percentage points, respectively (see **Figure 4**). In general, funds with lower overall equity allocations, and funds that maintained more of a “home bias” to U.S. markets, fared better. **Figure 5** shows that the four selected TDF providers maintained a wide range of overall equity and international equity allocations for 2008, contributing to the differences in returns across providers.

A closer look at the bond allocations

In 2008, the steep declines in equity markets, coupled with an uncertain outlook for many prominent financial institutions, led investors to seek the relative safety of government bonds. Historically, the correlation between stock and bond returns has been low; however, in extreme market conditions, as occurred in 2008, the correlation between equities and higher-risk, more aggressive bonds (i.e., corporate bonds) grew increasingly positive, as both asset classes posted negative returns.

Figure 5. Total stock versus international equity allocations of sample TDFs from four providers

	Retirement Fund		2025 Fund	
	Total stock allocation	International equity allocation	Total stock allocation	International equity allocation
Provider A	47%	39%	84%	36%
Provider B	39	20	78	25
Provider C	40	28	77	27
Provider D	31	20	77	20

Notes: “Total stock allocation” represents a percentage of the total portfolio. “International equity allocation” represents a percentage of the total stock allocation.

Since TDF portfolios use bonds as the primary diversifier vis-à-vis equities, it is important to recognize that the components of the bond allocation can contribute to the portfolio's overall level of risk and to its return variability, particularly over shorter periods. Bond allocations can vary from one provider to the next in sector allocations (e.g., U.S. government, mortgage-backed, corporate) as well as in characteristics such as duration and credit quality. In volatile equity markets, more aggressive bond allocations can exhibit higher correlations to equities, which can diminish a portfolio's diversification benefit. When examining a target-date strategy, it is vital for plan sponsors to consider the trade-off of holding a more aggressive bond allocation during the more conservative stages of a glide path with the possibility that the bond allocation might react similarly to a portfolio's equity allocation in an extreme downside market event such as we saw in 2008.

⁶ For purposes of this paper's analysis, “U.S. government” bonds refers to U.S. Treasury and government-agency bonds, per Morningstar's criteria.

Figure 6. Bond allocations of sample TDFs from four providers

	Retirement Fund				2025 Fund			
	Total bond allocation	U.S. government	Mortgage-backed	Corporate	Total bond allocation	U.S. government	Mortgage-backed	Corporate
Provider A	46%	35%	30%	21%	12%	5%	23%	54%
Provider B	48	5	38	36	15	6	32	41
Provider C	55	35	32	21	21	19	37	34
Provider D	63	49	28	13	22	32	43	21

Notes: "Total bond allocation" represents a percentage of the total portfolio. "U.S. government," "Mortgage-backed," and "Corporate" allocations represent percentages of the total bond allocation. Allocations do not add to 100%, because certain funds maintained small allocations to cash and international bonds, in addition to the sectors shown here.

As shown in Figure 6, fund providers appear to exhibit little consistency in their fixed income allocations. In 2008, this disparity contributed to the differences in returns across TDFs as certain funds maintained larger allocations to corporate bonds while others maintained larger allocations to U.S. government bonds. The return differentials were particularly noticeable in near-dated funds whose portfolios maintained a sizable fixed income allocation. It is not surprising that in 2008, funds with both a higher overall bond exposure and relatively higher allocations to U.S. government bonds performed better.

Different implementation strategies can lead to different returns

In comparing TDF returns, it is critical to consider not only differences in the portfolio's asset allocations but also differences in how the allocations are implemented. Some TDFs use passively managed funds (that is, index strategies) to construct their glide path, while others use actively managed products. Index

funds are designed to provide returns that are very close to those of their asset-class performance benchmarks. Active funds, on the other hand, offer potential value by attempting to outperform a benchmark—at the risk, of course, of subtracting value by underperforming the benchmark.

Active management can also take the form of a tactical allocation strategy, in which a manager adjusts a portfolio's asset and sub-asset allocations to capitalize on short-term market fluctuations across sectors. Tactical strategies pose a risk similar to that of actively managed funds: the potential to detract value by incorrectly timing buy and sell decisions.⁷ Actively managed strategies inevitably contribute to the differences in returns across the TDF landscape by charging higher expenses than passive strategies and incorporating manager risk into the risk profile of these portfolios.

⁷ In considering actively managed target-date strategies, plan sponsors need to examine the suitability of exposing investors to an additional layer of management risk beyond the market risk inherent in all TDF strategies.

Future considerations for evaluating TDFs

Among industry professionals, healthy debate continues on how best to construct target-date portfolios. These discussions typically revolve around the optimal level of equity exposure and the rate of change in that exposure as the investor ages, since these are the most recognizable components of risk in TDFs and their most significant long-term performance drivers. However, as we learned in 2008, over shorter periods, the equity glide path cannot be viewed in isolation, as the return differentials for funds with the same target date are not always proportional to the differences in equity exposure. Several components of a TDF portfolio— aspects that, notably, garnered more attention in 2008 than in previous years— can contribute to the portfolio’s overall performance. Although it is difficult to quantify the relative impact of these differences across providers, it is possible to draw high-level conclusions. Over long periods, research has shown that the asset allocation of a broadly diversified portfolio engaged in limited market-timing has had the most pronounced impact on performance. However, over shorter periods, as in 2008, 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. Ideally, plan sponsors can use this information to reinforce TDFs’ role as long-term investment vehicles and to better understand and communicate the funds’ relative risks and performance compared with similarly dated funds from other providers.

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P.O. Box 2600
Valley Forge, PA 19482-2600

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