

Improving Target date Offerings: Lessons Proven

Provided by FOLIO*fn* Investments, Inc.

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Executive Summary

Target date funds are the fastest-growing part of the mutual fund industry¹, and the most important. They are the central to the country's defined contribution (DC) retirement system, underpinning the premise that DC offerings can be both simple and effective. They are an investment for those who "default" into a retirement selection, and the preferred choice for those who want an all-in-one retirement investment. Consequently it is critical for much of working America that these target date offerings be a superb choice: well-designed and implemented, with reasonable costs, and with beneficial results.

Half a dozen years ago, Folio Investing began to examine the universe of target date fund families, with emphasis on the three fund families that dominate the industry (those three fund families today account for three-quarters of all assets in target date offerings). We concluded that the standard methodologies could be substantially improved. Our research suggested that these target date funds were i) not well designed from the outset, ii) not being modified over time to maintain appropriate risk targets, iii) not well described in terms of their goals, and iv) not flexible enough to serve varying investor needs. Given the importance of target date offerings as a primary "default" retirement vehicle, we introduced our own series of target date portfolios (what we call "Folios") to the public in late 2007, along with supporting research that explained the need for substantial changes in target date offerings.

The past five years -- some of the most volatile in the market history -- have validated our research and conclusions. With performance data for the Target date Folios and for target date funds over this period, we have unique insight into what is working with Target date funds, and what is not, and why.

Target date strategies can provide investors with the potential for gains provided by equities and other risky asset classes, while mitigating potential losses due to declines in any single asset class. Many target date funds, however, have failed to meet these goals as well as expected. Under-diversification in many funds resulted in their being over-exposed to major equity indexes, and their policy of maintaining static asset allocation at each point in the glide path (as opposed to having target risk levels) resulted in higher sensitivity to market shocks. These flaws have real world implications. High expenses in some funds will consume a substantial fraction of investors' lifetime wealth accumulation. Overall, we believe that investors in many of the available target date funds are likely to lose out on as much as half the expected future real returns from the equity and bond markets due to design flaws and high expenses.

As an alternative, the Target Date Folios, implemented using low-cost allocations to a diverse set of ETFs, have provided returns substantially higher than those provided by the majority of

¹ <http://www.pionline.com/article/20121029/DAILYREG/121029881/ibbotson-target-date-assets-hit-record-level-grow-36-in-12-months>

Target date funds. Moreover, these higher returns are achieved with lower sensitivity to market shocks such as we experienced in 2008 and in 2011.

In sum, the failure of many target date funds to deliver on their promise does not diminish the overall value or importance of target date strategies generally. It simply highlights the need to do it well. With almost five years of operational returns through Q3 of 2012, we have demonstrated that it is possible to implement target date strategies more effectively, with substantial benefits for investors.

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Introduction

Target date funds are the fastest-growing part of the mutual fund industry and are projected to grow to hold almost half of all assets in 401(k) and other defined contribution (DC) retirement plans by 2020². This substantial rate of growth is driven by a number of factors, including:

- The auto-enrollment of employees into retirement plans combined with the designation of Target date strategies as Qualified Default Investment Alternatives (QDIA);
- The simplification of retirement plan offerings with target date funds providing the easiest way to provide investors a “complete” investing solution in a single fund;
- The general lack of confidence among individual investors with respect to how to invest their retirement savings effectively, with target date funds being the default choice; and
- The data suggesting that target date funds lead to improved performance when compared to the choices that investors would make without such guidance. One study³ found that 401(k) plan participants who use some kind of help in selecting portfolios (Target date funds, online asset allocation advice, or separately managed accounts) out-performed those who had no help by an average of 2.9% per year, net of fees, from 2006 through 2010.

Nevertheless, while assets in target date funds are increasing rapidly⁴ along with a compelling narrative for future growth, important issues need to be addressed.

- Target date funds came under considerable criticism in 2008, when many funds designed for investors’ near retirement suffered dramatic losses. The return for the

² http://www.planadviser.com/Casey_Quirk_Predicts_Target_Date_Retirement_Fund_Growth.aspx

³ Help in Defined Contribution Plans: 2006 Through 2010 (<http://corp.financialengines.com/employer/2011HelpReport.pdf>)

⁴ http://www.planadviser.com/Target_Date_Funds_Up_in_3Q.aspx

funds aimed at investors with a projected retirement date of 2010 (referred to as 2010 funds) averaged -24.6% across the three fund families that hold more than three-quarters of the total assets invested in target date funds. While this loss level was considerably less extreme than the -37% return of the S&P500, 2008 resulted in enormous losses for investors on the cusp of retiring. In the aftermath of 2008, these funds were criticized for being too risky.

- Then, in 2009-2010, a period of substantially rising equity markets, target date funds generally delivered solid performance. It appeared that their significant failure just a year earlier was soon forgotten, but the positive returns failed to demonstrate whether the risk management issues with target date funds had been resolved.
- But 2011 provided another test. 2011 was not terrible for U.S. equities, but international, especially European, equities fared poorly. As our research shows (described more below) many target date funds' returns are highly correlated to both major domestic and international equity indexes. Consequently, target date fund performance, again, was generally not good. Many target date funds generated negative returns for the year, even though the S&P500 gained 2.1% (including dividends) and the Barclays Aggregate Bond Index gained 7.8%. The average 2011 return of all target date funds was -1.6%⁵.
- Even funds designed for people near retirement tended to lose money in 2011: the average 2015 fund tracked by Morningstar returned -0.4% in 2011⁶. This poor 2011 performance has now prompted a new round of review, and criticism⁷.
- Even worse, target date funds as a group performed poorly in Q3 of 2011 and their aggregate 2011 performance would have been even worse had it not been for a substantial rally in equities in Q4. We calculate⁸, for example, that the average of the 2010 funds from the three largest fund families returned -8% in Q3 – certainly enough to cause very significant strain on a recent retiree's funds. Morningstar found that the average return across all 2010 funds that they track was a return of -7.1% in Q3⁹. These significant swings are precisely what close-in target date funds (offerings for those near retirement) are supposed to mitigate.

⁵ <http://www.advisorone.com/2012/01/23/target-date-funds-beat-q3-returns-end-2011-down-ib>

⁶ <http://online.wsj.com/article/SB10001424052970204124204577150803937192884.html>

⁷ See note 3 above and http://www.northjersey.com/news/137943423_Target-date_funds_fall_short_and_may_stay_that_way.html

⁸ <http://portfolioist.com/2011/10/13/q3-2011-another-test-for-2010-target-date-funds/>

⁹ <http://www.thecfdd.com/files/targetdatefunds/2011Q3TargetMaturityReport.pdf>

For investors in or at retirement, losses as large as 7%-8% in a single quarter are excessive. Target date fund offerings continue to exhibit the same flaws as in 2008, notwithstanding the well-founded concerns raised then about the need for change.

Target Date Strategies and How Folio Investing Improved Them

The poor performance of target date funds in periods of market stress raises a number of questions about fund strategies. Some commentators believed that the magnitude of losses resulted from poor execution of otherwise sound design and strategies. Others concluded that the underlying theory was flawed and that core concepts such as diversification were no longer viable. And others concluded that nothing in fact has gone awry and that levels of loss exhibited in volatile periods are simply inevitable outcomes of extreme market conditions.

We have a unique perspective from which to address this question of what's gone wrong target date funds. In 2006, we concluded that the traditional approach was flawed, as described below. To provide investors and plan sponsors with a better solution, we designed and launched an alternative set of target date allocations.

These new target date allocations, what we call Target date Folios,¹⁰ were launched and made publicly available by Folio Investing in late 2007. Although Folios are not mutual funds or ETFs, they are portfolios of securities (here, ETFs) that an investor can buy or sell in a single transaction. These Folios, like all folios on the Folio Investing platform, can also be customized if an investor wants a more tailored solution. To ensure a true performance record that includes "real world" effects (such as bid-ask spreads and expense ratios), Folio Investing funded these Folios and traded them on the Folio Investing platform.

The Target date Folios match standard target retirement dates in that they are designed for projected retirement dates in five-year increments: 2010, 2015, 2020, etc. through 2060. The Folios' strategies are very different from industry practice, however.

Our view of the limitation of traditional target date fund has now been proved out with the relative performance of the funds versus Folios since the Target Date Folios were launched. The principle fund limitations include:

- 1) Low levels of effective diversification; and
- 2) The use of asset allocation glide paths as a surrogate for risk, as opposed to the use of target risk along the glide path.
- 3) A one size-fits all approach to target date year risk levels;
- 4) Inadequate descriptions of what an investor should expect; and

¹⁰ <https://www.folioinvesting.com/whatfolios>

5) Relatively high expenses.

Diversification and Risk

Our initial research identified the most critical problems with the target date fund design: under-diversification, and a reliance on asset allocation as opposed to risk budgeting for the glide path. These significant flaws persist today.

Even though target date funds generally hold multiple underlying funds which themselves each hold hundreds of individual securities, they are not well diversified. Diversification requires more than just owning a large number of holdings. “Naïve diversification,”¹¹ as it is referred to, is achieved by combining a large number of individual securities in a portfolio. By contrast, “strategic” diversification entails the selection of holdings specifically to exploit low correlations between them, with the goal of maximizing expected return vs. risk. Our research suggests that many target date funds are using a naïve diversification strategy. For example, the combination of 60% S&P500 stocks and 40% bonds is often used as a proxy for a diversified portfolio. But this portfolio’s returns exhibit a 99% correlation to the S&P500, and have for a long time. Put another way, this portfolio is highly correlated to a single asset class -- large-cap U.S. stocks. When those securities decline significantly, so will the 60/40 portfolio. The bond allocation reduces risk, but the portfolio remains almost perfectly correlated to the S&P500. In recent decades, international equities (as measured by the EAFE index, for example) have become increasingly correlated to U.S. equities, so that even the modest diversification benefits historically provided by combining large cap domestic and international stocks are substantially diminished.

The table below shows how *very high* the actual correlations are of target date fund returns to returns of the major stock indexes. Each composite portfolio for the specified target year is equally weighted among the funds from the three largest target date fund families. These fund families currently hold 75% of all target date fund assets.

¹¹ http://papers.ssrn.com/sol3/papers.cfm?abstract_id=294735

| Correlation to: | Portfolio equally weighted to three largest 2040 funds | Portfolio equally weighted to three largest 2030 funds | Portfolio equally weighted to three largest 2020 funds | Portfolio equally weighted to three largest 2010 funds |
|------------------------|--|--|--|--|
| S&P500 Stocks | 99% | 99% | 98% | 98% |
| EAFE Stocks | 95% | 95% | 95% | 95% |
| Emerging Mkt Stocks | 92% | 92% | 92% | 92% |
| 10-Year Treasury Yield | 39% | 37% | 34% | 30% |
| VIX | -69% | -68% | -67% | -66% |

Correlation of returns between target date fund portfolios and major asset classes and indexes (four years through October 2012)

Surprisingly, even the least risky of the target date funds – the 2010 funds -- show a very high correlation to the S&P500 and a slightly lower correlation to the EAFE. The significant correlation of these target date funds to the EAFE index, which returned -12.1% in 2011, explains the funds' poor performance (relatively speaking) in that year, even with a small gain for the S&P 500. The average return of the three largest 2020 target date funds was -0.7% and the average return of the three largest 2040 funds was -3.6% in 2011, even though the S&P500 gained 2.1% (including dividends) and the Barclays Aggregate Bond Index gained 7.8%.

The returns from the target date fund composites have a strong negative correlation to market volatility, as measured by the VIX index. A market with rising VIX will tend to correspond to negative returns from target date funds, and vice versa. Similarly, returns from stock indexes also exhibit a very strong negative correlation to VIX. The conclusion to be drawn here is that volatility shocks in the equity markets, which will correspond to a rise in VIX, will tend to have a substantial negative impact on target date fund performance. But these are precisely the conditions in which investors hope that diversification will protect them.

Powerful counter-points to the Target date funds' high correlations are the uniformly and significantly lower correlations of the Target date Folios to these same indexes. And although low correlations are not themselves the goal, they do reflect the opportunities that result from strategic diversification. It is the low correlation of a portfolio to major asset classes -- where asset classes move distinctly from one another – that demonstrates the risk mitigation in a portfolio:

| Correlation to: | 2040 Moderate Folio | 2030 Moderate Folio | 2020 Moderate Folio | 2010 Moderate Folio |
|------------------------|---------------------|---------------------|---------------------|---------------------|
| S&P500 Stocks | 91% | 85% | 87% | 86% |
| EAFE Stocks | 91% | 89% | 87% | 85% |
| Emerging Mkt Stocks | 90% | 88% | 84% | 83% |
| 10-Year Treasury Yield | 14% | 6% | 5% | 5% |
| VIX | -60% | -56% | -56% | -54% |

Correlation of returns between current Target date Folios and major asset classes and indexes (four years of data through October 2012)

The performance of the 2010 Moderate¹² Folio versus the composite performance of the three largest 2010 Target date Funds demonstrates why these correlations matter:

| Target Date Folios / Funds Return | Since Inception (12/21/07 -- 09/28/12) | Year 2008 | Year 2009 | Year 2010 | Year 2011 |
|---|--|-----------|-----------|-----------|-----------|
| 2010 Moderate Target Date Folio | 21.0% | -18.1% | 18.0% | 10.9% | 5.2% |
| Average of 3 Largest 2010 Target Date Funds | 16.5% | -24.7% | 24.3% | 12.1% | 1.2% |
| Average Annual Folio Advantage | 0.8% | 6.6% | -6.3% | -1.2% | 4.0% |

Performance Since Inception (12/21/07 to 9/28/2012) of the 2010 Folios versus the composite performance of the three largest 2010 Target date Funds¹³

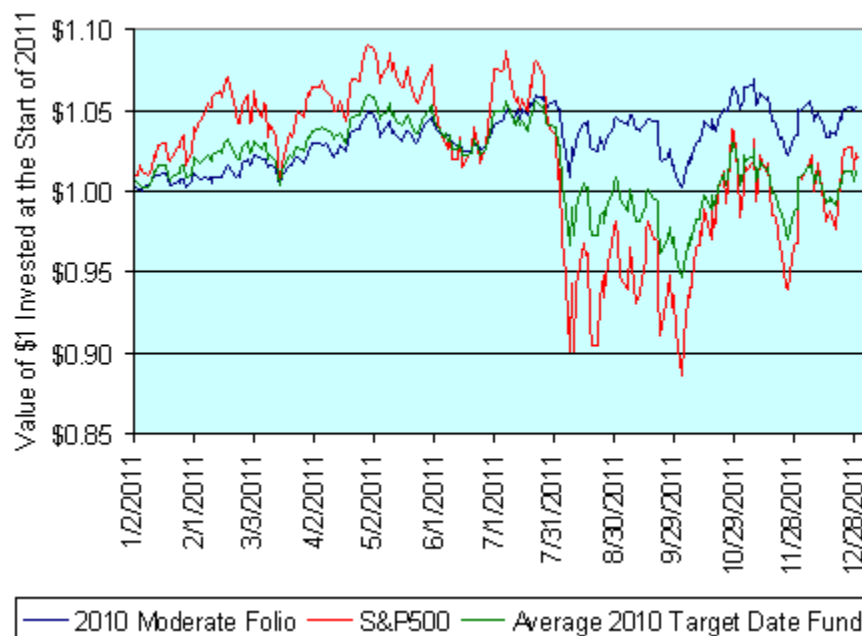
The 2010 Moderate Folio performed much better in 2011 and in 2008 than the composite of the three largest funds, while under-performing those funds in 2009 and slightly under-performing in 2010. Since inception, the 2010 Moderate Folio has provided a cumulative 4.5% in return beyond that of a composite of the three largest 2010 target date funds. As important as the extra return is, the risk mitigation is equally important. The substantially less extreme loss in 2008 and the higher returns in 2011 in the Folio vs. the largest funds are notable.

These cumulative performance numbers don't tell the entire story. The higher inverse correlations to VIX in the previous table suggest that the target date funds are more susceptible

¹² The "Moderate" risk folios are designed as alternatives to traditional funds' typical risk levels.

¹³ In this table and in all performance tables in this paper, we have reduced the actual returns of the Folios by 38 bps per year to represent the potential impacts of brokerage expenses.

to ‘shocks’ to the broad stock indexes than the Folios. The sensitivity of different funds and folios to a volatility shock is reflected in their performance during the volatile third quarter of 2011:

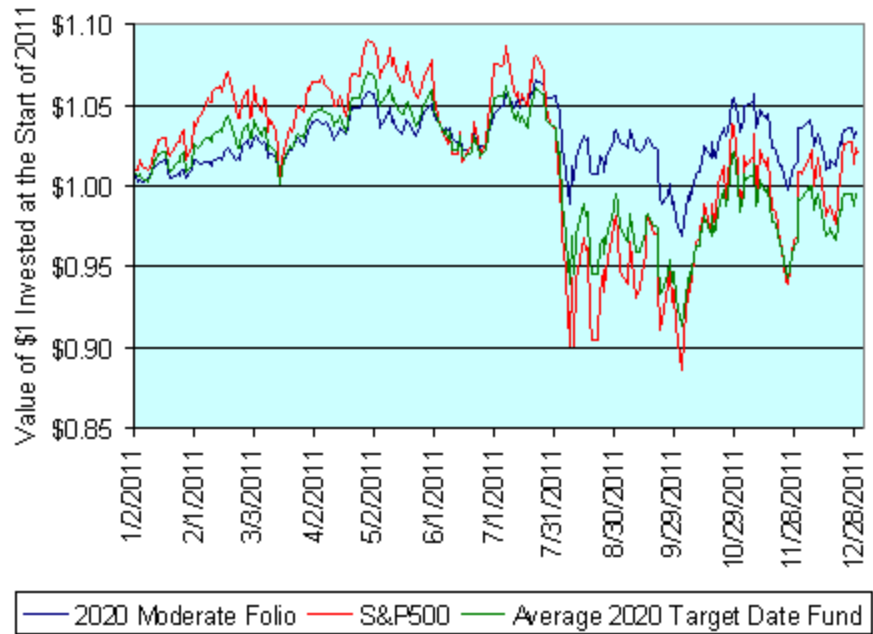


2010 Moderate Folios vs. Composite Investment in Three Largest 2010 Funds During 2011 (these results include a 38 bps cost for the Folio, accrued daily)

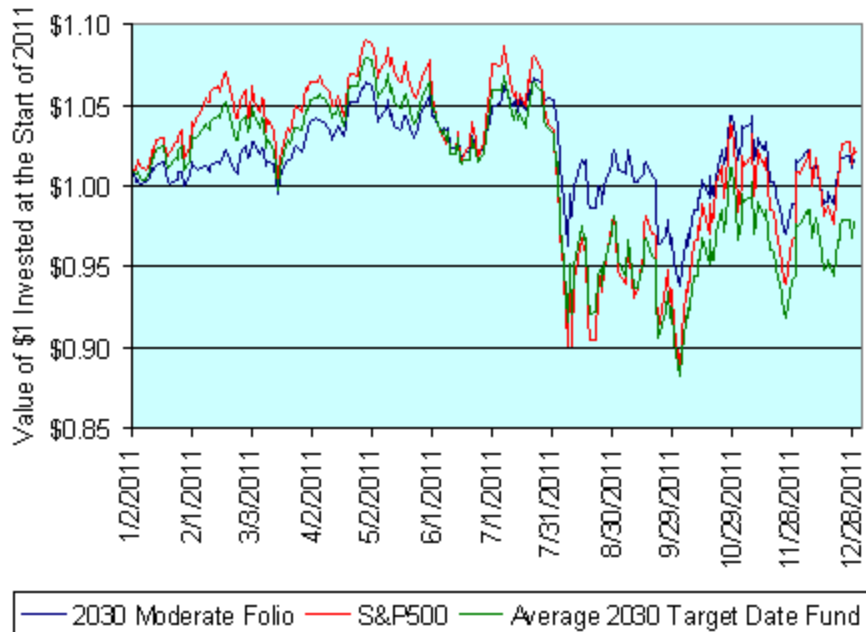
The 2010 Moderate Folio and the composite of the three 2010 funds tracked together through mid July, as the market broadly rose and volatility declined. But when the S&P500 suffered a major and rapid decline, and market volatility substantially increased from late July through early October of 2011, the composite of the 2010 Target date funds suffered far more than the 2010 Moderate Folio, as theory and design suggested it would. When the U.S. market rallied late in 2011, the composites of the three largest fund families rose to some extent but they were limited by their substantial correlations to Europe.

Abrupt losses are unsettling to investors, but especially for those close to, or in, retirement. The composite of the three largest 2010 target date funds moved from a year-to-date gain of slightly more than 5% in the middle of July 2011 to a 5% loss for the YTD by the start of October. Is the potential for a 10% decline in portfolio value over a two-and-a-half month period acceptable for investors in retirement? There can be no definitive answer, but we are concerned by this level of loss exposure to the major equity indexes.

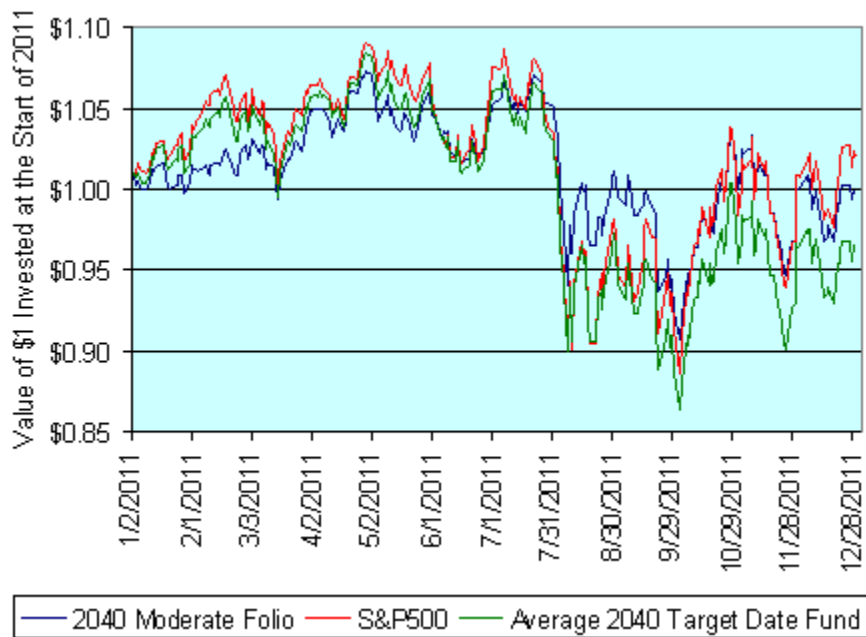
When we look at the 2020, 2030, and 2040 target date results (below), we see the same pattern of behavior but the loss response to a decline in the S&P500 is even more dramatic.



2020 Moderate Folio vs. Composite Investment in Three Largest 2020 Funds During 2011



2030 Moderate Folio vs. Composite Investment in Three Largest 2030 Funds During 2011



2040 Moderate Folio vs. Composite Investment in Three Largest 2040 Funds During 2011

The composite performance statistics for the Target Date Folios (Appendix A) shows that the Folios out-performed substantially in 2008, but one may argue that 2008 was a once-in-a-lifetime fluke or that the funds have evolved to be less risky. The fund performance in 2011

demonstrates the high sensitivity of the largest funds to the major equity indexes, as well as showing how Folios can provide a viable alternative.

We now have about five years of operational track record to validate the Target Date Folio methodology. Criticisms directed at target date strategies as a whole are misdirected. Simply put, the concept of a target date offering makes sense. The results produced by the largest target date funds over the past five years suggest problems with the specific implementation of target date strategies rather than of the concept as a whole. Those suggesting the failure of diversified strategic asset allocation -- a major underpinning of both target date funds and Folios -- miss the important conclusion to be drawn from the performance of Target date Folios: *well-diversified strategic asset allocations do provide substantial risk mitigation*, while also maintaining appropriate allocations to equities and other asset classes with substantial return potential. The problem with many of the existing target date funds is that they are simply not effectively diversified and the final asset allocations are very highly correlated to the major equity indexes. It is not unexpected then that their performance is almost entirely determined by the performance of these indexes and that even the funds for people near retirement will suffer substantial losses if the major indexes fall dramatically. The Target Date Folios demonstrate that improved diversification results in better returns for a given risk level and mitigates the impacts of a large loss in any single asset class.

Risk Management

One of the central elements of designing and managing a target date strategy is determining appropriate risk levels at each stage in a prospective investor's life and managing portfolios to ensure that the risk levels in a portfolio remain consistent with targets through time. There are different ways to measure and achieve target risk levels. In its simplest form, the target portfolio risk level is expressed by the relative allocation to equities and to fixed income in the portfolio. The greater the percentage allocated to equities, the greater the presumed risk. As retirement approaches, target date strategies typically reduce the allocation to equities along a glide path that is intended to be hold for the life of the fund. This approach is attractive for its simplicity, easy to manage, and easy to describe and monitor. There are some pitfalls in this approach to managing portfolio risk, however.

The goal of risk management is matching asset allocations to risk targets. Once a target risk level is determined, the portfolio is managed to maintain that desired level of risk through changes in asset allocation. This distinction in approach is critical.

Risk in an asset allocation is primarily determined by two factors: estimates of the expected risk in each asset class and the correlations between asset classes. As correlations among asset classes increase -- as they tend to do in times of market stress -- the risk of almost every asset allocation tends to increase. This risk increase occurs even if the expected volatility of individual asset classes does not increase. For example, over the past five years, a model

portfolio equally allocated to five asset classes -- S&P500, EAFE, emerging market stocks, TIPS and an aggregate bond index -- has risk levels that, according to our estimates, *have varied by as much as 29%* due to increases in correlation *in a single year*. Consequently, budgeting for risk has to include consideration of time-varying correlations between asset classes and the variability in market risk – a static asset allocation “glide path” does not do that. During times of market calm, correlations may decrease and risk decreases. Targeting risk allows for adjustments to asset allocations that will help to maintain a fairly constant portfolio risk level. Maintaining a static asset allocation for any given target date (as expressed in the traditional glide path) means that investors may be exposed to wildly varying levels of portfolio risk.

Consequently, a “glide path” that usefully and accurately informs the design of a target date strategy should target risk levels over the course of an investor’s life, described in terms of specific risk targets (measured, for example, by volatility), rather than asset allocation glide path¹⁴.

This approach to risk budgeting is a key element of the Target Date Folios. Changes in the projected risk level for asset allocations through time can result in substantive changes in the asset allocations. From 2011 to 2012, for example, the Target Date Folios’ asset allocations were materially modified to decrease their allocations to TIPS while municipal bond ETFs were added. This change was driven by the changes in the correlations between asset classes and their impact on aggregate portfolio risk levels.

Matching Investor Risk Tolerance

As an additional consideration, our survey of target date funds led us to conclude that the industry’s notion that target retirement year by itself was sufficient for all investors retiring in any given period – a “one-size-fits-all” approach to investors in any given retirement cohort -- was not ideal. In other words, we believe retirement year alone is not sufficient to determine an investor’s ideal risk-return balance.

There are many other factors that can influence an investor’s choice and risk tolerance, such as differing views as to the income to be derived from a portfolio, or whether an investor will remain invested *through* retirement years or are likely to “cash out” *at* retirement (often referred to as “to or through”).

Consequently, while target date funds are an important innovation in terms of providing an “off-the-rack” investment solution, many investors benefit from the ability to tailor their portfolio risk levels. For that reason, Target Date Folios are offered at Conservative, Moderate, and

¹⁴ In addition, it is important to understand the portfolio exposure to specific key drivers. The principal variables we track for this purpose are portfolio correlations to major equity indexes, VIX, and ten-year Treasury yield.

Aggressive risk levels. Because they are Folios, each can be further modified or customized if desired.

The Folio solutions were designed with two goals: to minimize the risk that an investor would run out of money in retirement (longevity risk) and to minimize the risk of under-performing a risk-free asset from an investor's current age to retirement. The Conservative glide path places more emphasis on protecting current assets and is more appropriate for an investor likely to annuitize all or part of his portfolio. The Moderate glide path is designed for an investor who plans to remain invested and draw income systematically throughout retirement. The Moderate glide path is designed to 'fault tolerant' in the event that an investor decides to annuitize some fraction of the portfolio at retirement. The Aggressive glide path is designed for investors who desire a portfolio with higher return potential and can tolerate the elevated risk levels that accompany such a portfolio.

Because of the way that Target Date Folios are constructed, investors, advisors and plan sponsors can easily customize the asset allocations even further if desired. A software company plan sponsor, for example, may wish to under-weight software in the investment portfolios to reduce the total economic impact of a downturn in the software industry. This level of tailoring is a unique feature of implementing a target date strategy via a Folio rather than a fund.

Expenses

Given that target date vehicles are intended to be held over an entire working career, special attention must be paid to expenses. According to Morningstar, the average expense ratio for target date funds is 0.83%, ranging from a low of 0.18% to a high of 1.3%¹⁵. The average expense ratio for the Target Date Folios is 0.26%. A simple calculation by the Department of Labor suggests that a 1% increase in expenses equates to a reduction of 28% in lifetime accumulated savings¹⁶. More sophisticated and realistic calculations broadly agree with this level of impact¹⁷. Expenses are a major determinant of how much wealth investors in target date vehicles can accumulate over their working careers. Under the assumption of a typical 4% withdrawal rate for people in retirement, a difference of 0.6% per year due to expenses (average fund expense minus average Folio expense) is equivalent to 15% of an investor's annual income in retirement. Costs have a huge impact on investors' ability to build wealth over their lifetimes and on the amount of income that they can afford to draw in retirement.

Conclusions

¹⁵http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/TargetDateFundSurvey_2012.pdf

¹⁶ http://www.dol.gov/ebsa/publications/401k_employee.html

¹⁷ <http://portfolioist.com/2012/06/05/are-401k-fees-consuming-30-of-our-lifetime-savings/>

The enormous market swings in recent years have wreaked havoc with many investors' long-term plans. The anemic returns from equities (1% annualized returns over the five years through October 2012)¹⁸ have put many investors behind their planned savings targets. In addition, the high levels of volatility have been unsettling. These are the kinds of conditions that really make the case for diversified portfolios at an appropriate risk level. Well-diversified portfolios mitigate a portfolio's sensitivity to any single asset class. Furthermore, having access to portfolios that are designed with appropriate risk benchmarks should help investors to closely match their risk exposure to their needs.

We have the unique perspective of almost five years of performance history with an alternative approach to creating target date strategies. As we approach five years of performance data, the Target Date Folios have out-performed the target date funds that hold 75%-80% of all target date assets (the three largest fund families in the Target date fund business). The Target Date Folios substantially reduced losses in 2008 vs. the funds and the equity markets as a whole, as well as keeping up with the broad rally in equities in 2009-2010 (see Appendix A). In addition, the Target Date Folios out-performed the largest target date fund families in 2011, a volatile year that ended with a modest positive return for the S&P500 but with negative returns for many target date funds. The substantial rally in equities in 2012 has allowed largely un-diversified strategies to perform very well. The 2040 Moderate Folio has returned 9.7% through Q3, but that is considerably behind the average of the three largest 2040 funds, which have averaged 13.8% over this period. The S&P500 has gained a total of 16.4% through Q3.

When the largest 2010 target date funds lost an average of 24.6% in 2008, investors and market observers were surprised. The fairly large losses suffered by these funds in Q3 of 2011¹⁹, revived questions with regard to risk management of 2010 funds. We hope that another market shock will not be required to keep attention focused on the need for improved target date designs.

When we first analyzed Target date funds, we estimated that under-diversification was costing investors in these funds on the order of 2% per year in return. The Target date Folios were designed, in part, to capture this additional return. Four years later, the Target date Folios have generated slightly more than 1.4% per year in additional return, even after assuming a substantial burden associated with brokerage fees (see Appendix A). The fact that the realized return advantage so closely matches our projections is compelling.

¹⁸ http://performance.morningstar.com/fund/performance-return.action?p=investor_returns_page&t=VFINX®ion=USA&culture=en-us

¹⁹ <http://portfolioist.com/2011/10/13/q3-2011-another-test-for-2010-target-date-funds/>

We have also calculated an annualized alpha for the Target Date Folios. The average alpha²⁰, since inception, for all of the Target Date Folios up to a projected retirement date of 2045 is 1.7%²¹. The average alpha for the composite of the three largest target date fund families for the same range of target dates is 0.2%. The alphas for each Folio are included in Appendix A, along with alphas for fund composites. Because alpha results from the degree to which the returns exceed what can be explained by exposure to an equity index (the S&P500), we expect that any portfolio that includes allocations to other asset classes (bonds, in particular) will allow the portfolio to generate positive alpha. In a target date portfolio, alpha primarily measures the effectiveness of diversification. The alpha that is obtained simply by diversifying a portfolio beyond equities might be called ‘passive alpha.’ We believe that one of the primary aims of the asset allocations in target date strategies is to provide this passive alpha to investors.

Overall, our conclusion is that target date strategies are a very positive development for investors, although the execution of target date strategies as they have been deployed by the most popular funds needs to be substantially improved. Nothing that we are proposing is revolutionary or heretical from the perspective of investing theory. In fact, our approach is broadly consistent with results²² from a number of well-known asset management practitioners.

The potential importance of bringing a more sophisticated portfolio management approach to bear on target date strategies, as we describe here for Target Date Folios, can hardly be over emphasized. It is not unreasonable to estimate that diversified portfolios of equities and bonds may return something on the order of 4% net of inflation²³. If we are correct with regard to the value of more effective diversification (estimated to be on the order of 2% per year), fully half of the potential real returns available to investors could be missed if better asset allocation strategies are not implemented. In addition, more sophisticated risk management procedures, as described here, can be of great importance in keeping portfolio risk levels within bounds that will be acceptable to retail investors.

²⁰ This is CAPM (single factor) alpha

²¹ The 2050, 2055, and 2060 Target Date Folios were launched in mid 2010 and estimates of alpha for this short a period since inception are very unstable and, consequently, are not included here.

²² <http://www.quantext.com/DiversificationPremium.pdf>

²³ http://www.advisorperspectives.com/newsletters12/Jeremy_Siegel_Rob_Arnott_and_Other_Experts_Forecast_Equity_Returns.php

About Folio Investing

Online brokerage [Folio Investing](#) is a division of FOLIO*fn* Investments Inc. The company enables investors and financial advisors to manage stocks, ETFs, and mutual funds as integrated investment portfolios called “Folios” that deliver control, transparency, and low cost. Investors can create their own Folios, much like creating personalized ETFs or mutual funds, or invest in over 150 Ready-to-Go Folios representing market indices, industry sectors, geographical regions, [target dates](#), and more. The Folio Unlimited pricing plan features unlimited commission-free trading in twice-daily windows for only \$29 per month or \$290 per year.

Ready-to-Go Folios can be managed or unmanaged, are not registered investment companies, and are offered by FOLIO*fn* Investments Inc., a registered broker-dealer. FOLIO*fn* Investments Inc., member of FINRA/SIPC, does not provide investment, tax, or legal advice.

Appendix A: Target Date Folio Performance

| Target Date Folio / Fund Return | | YTD 2012 through 09/28/2012 | 2012 Q3 | Since-inception (12/21/07 -- 09/28/12) | Year 2008 | Year 2009 | Year 2010 | Year 2011 | Annual Alpha |
|--|--------------|-----------------------------|-------------|--|---------------|--------------|--------------|--------------|--------------|
| Target 2010 | Conservative | 4.9% | 3.4% | 24.9% | -12.6% | 14.7% | 10.6% | 6.6% | 3.8% |
| | Moderate | 7.4% | 4.8% | 21.0% | -18.1% | 18.0% | 10.9% | 5.2% | 2.7% |
| | Aggressive | 8.1% | 5.2% | 11.8% | -25.7% | 22.3% | 11.2% | 2.9% | 0.8% |
| Average of Largest 3 Target Date 2010 Funds | | 9.8% | 4.3% | 16.5% | -24.7% | 24.3% | 12.1% | 1.2% | 1.6% |
| Target 2015 | Conservative | 4.9% | 4.6% | 20.3% | -13.7% | 14.7% | 10.5% | 4.5% | 2.8% |
| | Moderate | 7.8% | 5.2% | 21.3% | -21.1% | 19.3% | 14.4% | 4.7% | 2.6% |
| | Aggressive | 8.6% | 5.2% | 10.4% | -26.8% | 23.0% | 11.8% | 1.6% | 0.5% |
| Average of Largest 3 Target Date 2015 Funds | | 10.5% | 4.7% | 14.4% | -27.6% | 26.3% | 12.9% | 0.3% | 1.2% |
| Target 2020 | Conservative | 5.4% | 4.6% | 19.2% | -17.0% | 16.5% | 11.3% | 5.0% | 2.4% |
| | Moderate | 8.6% | 5.2% | 18.7% | -24.3% | 21.2% | 15.7% | 3.4% | 2.0% |
| | Aggressive | 8.2% | 5.3% | 9.9% | -29.9% | 25.9% | 15.1% | 0.1% | 0.5% |
| Average of Largest 3 Target Date 2020 Funds | | 11.4% | 5.1% | 11.2% | -31.4% | 28.9% | 13.9% | -0.7% | 0.5% |
| Target 2025 | Conservative | 7.3% | 4.9% | 22.9% | -18.0% | 18.1% | 12.4% | 5.3% | 3.0% |
| | Moderate | 8.5% | 5.4% | 17.4% | -25.7% | 22.3% | 16.1% | 3.1% | 1.8% |
| | Aggressive | 9.7% | 5.4% | 11.0% | -31.1% | 27.2% | 16.4% | -0.1% | 0.7% |
| Average of Largest 3 Target Date 2025 Funds | | 12.4% | 5.5% | 9.3% | -33.8% | 30.6% | 14.6% | -1.7% | 0.2% |
| Target 2030 | Conservative | 7.7% | 5.3% | 21.3% | -21.1% | 19.4% | 14.4% | 4.7% | 2.6% |
| | Moderate | 8.0% | 5.4% | 15.4% | -26.8% | 23.0% | 17.4% | 1.6% | 1.4% |
| | Aggressive | 10.1% | 5.4% | 12.5% | -32.1% | 30.0% | 18.2% | -1.7% | 1.0% |
| Average of Largest 3 Target Date 2030 Funds | | 13.0% | 5.8% | 6.1% | -36.5% | 32.1% | 15.2% | -2.4% | -0.4% |
| Target 2035 | Conservative | 7.6% | 4.8% | 19.3% | -22.8% | 21.1% | 14.8% | 3.4% | 2.2% |
| | Moderate | 8.5% | 5.0% | 13.5% | -29.2% | 26.0% | 18.0% | 0.1% | 1.1% |
| | Aggressive | 9.9% | 5.1% | 11.8% | -32.9% | 31.1% | 19.4% | -3.0% | 0.9% |
| Average of Largest 3 Target Date 2035 Funds | | 13.6% | 6.2% | 5.1% | -37.7% | 33.1% | 15.7% | -3.4% | -0.5% |
| Target 2040 | Conservative | 8.2% | 5.1% | 18.8% | -24.3% | 21.1% | 15.7% | 3.8% | 2.0% |
| | Moderate | 9.7% | 5.4% | 12.9% | -31.1% | 27.1% | 18.5% | -0.1% | 1.1% |
| | Aggressive | 10.9% | 4.9% | 10.7% | -34.7% | 34.2% | 20.3% | -5.6% | 0.8% |
| Average of Largest 3 Target Date 2040 Funds | | 13.8% | 6.3% | 4.7% | -38.0% | 33.5% | 15.8% | -3.6% | -0.6% |
| Target 2045 | Conservative | 8.5% | 5.4% | 18.7% | -24.3% | 21.1% | 16.2% | 3.1% | 2.0% |
| | Moderate | 10.2% | 5.4% | 11.8% | -32.1% | 27.1% | 20.1% | -1.8% | 0.9% |
| | Aggressive | 13.4% | 4.2% | 12.2% | -34.7% | 34.2% | 21.1% | -7.0% | 1.1% |
| Average of Largest 3 Target Date 2045 Funds | | 13.9% | 6.3% | 4.4% | -38.2% | 33.5% | 16.0% | -3.7% | -0.6% |
| S&P500 Index (Total Return) | | 16.4% | 13.3% | 7.0% | -37.0% | 26.5% | 15.1% | 2.1% | |

| Target Date Folio / Fund Return | | YTD 2012 through 09/28/2012 | 2012 Q3 | Since-inception (12/21/07 -- 09/28/12) | Year 2008 | Year 2009 | Year 2010 | Year 2011 | Annual Alpha |
|--|--------------|-----------------------------|--------------|--|---------------|--------------|--------------|-------------|--------------|
| Target 2050* | Conservative | 8.3% | 5.5% | 27.9% | | | | 3.1% | 3.3% |
| | Moderate | 10.1% | 5.4% | 29.6% | | | | -1.8% | 0.3% |
| | Aggressive | 13.4% | 4.2% | 25.4% | | | | -7.0% | -4.1% |
| Average of Largest 3 Target Date 2050 Funds | | 14.0% | 6.4% | 28.0% | | | | | -2.5% |
| Target 2055* | Conservative | 8.0% | 5.4% | 25.8% | | | | 1.6% | 1.8% |
| | Moderate | 10.3% | 5.4% | 28.0% | | | | -3.1% | -1.0% |
| | Aggressive | 13.4% | 4.2% | 25.4% | | | | -7.0% | -4.1% |
| Average of Largest 3 Target Date 2055 Funds | | 14.3% | 6.6% | | | | | | |
| Target 2060* | Conservative | 8.0% | 5.4% | 25.8% | | | | 1.6% | 1.8% |
| | Moderate | 10.2% | 5.4% | 26.3% | | | | -4.4% | -2.4% |
| | Aggressive | 13.4% | 4.2% | 25.3% | | | | -7.0% | -4.1% |
| Average of Largest 3 Target Date 2060 Funds | | | | | | | | | |
| S&P500 Index (Total Return) | | 16.4% | 13.3% | 37.8% | -37.0% | 26.5% | 15.1% | 2.1% | |

* Target Date 2050, 2055 and 2060 launched on Jul 14, 2010 and had shorter period of performance data.

1. Inception date for the 2010 to 2045 Folios is 12/21/2007 and the inception date for the 2050 to 2060 Folios is 7/14/2010.
2. Target Date Folio results have been reduced by 0.38% per year, to reflect an estimate for brokerage expenses. We calculated the average returns for all Target Date mutual funds in the stated categories over the stated period. The 1.46% figure is the average out-performance for 2010, 2015, 2020, 2025, 2030, 2035, 2040, and 2045. We obtained data from Yahoo! Finance and mutual fund companies to determine the population of funds and as our source for fund performance information.
3. Comparisons to 2055 and 2060 are generally not shown as most target date fund offerings do not extend to those dates.
4. Alpha is a performance statistic that shows us if a portfolio has generated returns greater than what would be expected based on its risk level, by measuring investment return beyond what can be explained by market risk. Generating higher returns by investing in a riskier portfolio will not result in positive alpha. Similarly, generating above market returns during a market decline by investing in a low-risk portfolio will not result in positive alpha.

We provide these statistics to enable you to make informed choices, as different Target Date Folios have different risk levels and Alpha provides insight into the relative performance of the portfolio beyond differences in risk level.

5. These funds were not available during some of the time periods shown here, represented by NA for Not Applicable.

As with any investment, investments in Target Date Folios are subject to investment risk including the loss of the principal amount invested. Investors should consider the investment objectives and risks of the Target Date Folios before investing. For more information regarding the Target Date Folios, please visit www.folioinvesting.com. The results through August 2009 are model returns. Past performance is no guarantee of future results. Average performance of the largest 3 target date mutual funds is included to help you assess whether you would have been better off investing in such mutual funds, or with the Target Date Folios.

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