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Fixing Target Date Strategies: "Target Date Folios"

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Target Date Folios

Summary

FOLIO*fn* has developed Target Date Folios to improve upon the benefits of target date mutual funds. The approach is designed to yield the benefits of target date funds (ease of use, diversification, and a reasonable equity glide path) while providing the benefits of direct equity ownership and Folio style investing: increased transparency, the ability for individual investors to customize the underlying assets in the portfolios, improved tax management, and the low investment expenses of Folio Investing.

Background

Target Date Funds (also known as Lifecycle funds) have received considerable attention in recent years. The motivation behind these funds is that many retail investors do not implement the two key elements of asset allocation in planning for retirement:

1) Diversification is crucial to getting the most return for a given level of risk
2) Different portfolio risk/return profiles are appropriate for different stages in life

Multiple studies have shown that a significant fraction of retail investors do not invest across the most basic asset classes. Almost 1/3rd of 401(k) plan participants have all of their assets invested in one or two sectors. It is also far too common for the employer's stock to be the largest single investment[1]. Because of this under-diversification, many investors are missing the benefits conferred from item (1). Where investors stand on item (2) is not as well documented, largely because the data is more complex, but recent results from a ten-year study suggest that 401(k) plan participants who invest in target date funds tend to out-perform their peers who do not[2].

Target Date funds are designed to assist investors in managing both items (1) and (2). The various providers set up target asset allocations that are determined by how many years are left until a person retires. The shift in asset allocation is invariably towards becoming more conservative as retirement approaches. Investors in target date funds have only one thing to specify: their retirement date. While this idea is intuitively appealing, it also raises some potential problems. First and foremost, the target date funds vary widely in terms of how they allocate assets at each stage of the investor's life. Some target date funds have much higher allocations to equities (lower allocations to bonds) than others at a specific age range. Even this large discrepancy does not capture

[1] http://www.hewittassociates.com/_MetaBasicCMAssetCache_/Assets/Articles/2005_benchmarkhighlights.pdf

[2] http://www.manulife.com/corporate/corporate2.nsf/Public/us100807.html

the magnitudes of the differences between these funds. Some funds have no allocation to commodities or energy beyond their representation in the broad indices (i.e., because energy firms are some fraction of the S&P500). The details of the asset allocations of these funds over time are determined by the idealized assumptions that a target date fund makes about its investors and how they behave. Some of these funds assume that the 'model' investor will cash in his/her retirement portfolio at retirement and purchase an annuity[3]. If this is the operative assumption, the asset allocation tends to be very conservative as retirement approaches because of the hard 'deadline' at which the investor requires a specific threshold of wealth to purchase an annuity. On the other end of the spectrum, some target date funds assume that investors will draw income from their portfolios through retirement[4]. Because people are living longer in retirement, this approach tends to result in more aggressive asset allocations to provide the necessary wealth for the long haul.

The idea of the 'model' plan participant is another of the potential concerns with the design of target date funds. There are questions as to whether the assumed 'model' behavior actually matches the way that investors are saving and will ultimately withdraw their funds.

Another challenge for target date funds is expenses. Because most of these funds simply purchase other mutual funds within a fund family, investors typically end up paying two layers of fees—and this makes many target date funds expensive to own.

The final oft-cited issue with target date funds is that they are designed to be the only investment that you own[5]. In practice, however, many investors are uncomfortable with the notion that they can or should buy only one mutual fund and keep putting money into this one fund every year.

Considering the fact that that the two issues that motivated the creation of target date funds are very important and that many investors are not doing the best job that they could with these two issues, we assert that there is value in the concept of target date portfolios for many people. What would a better target date type of investment look like? A list of desirable features is shown below:

1) Very well-diversified across major asset classes
2) Low expenses
3) Provide baseline shift in asset allocation over time
4) Provide variations on this baseline to meet more specific investor needs
5) Support customization in the asset allocation over time

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[3] http://www.stat.washington.edu/compfin/Seminars/Current/Target%20Date%20Funds%20White%20Paper%20Final%2090806.pdf

[4] https://www.alliancebernstein.com/institutional/Registered/ArticleDetail.aspx?cid=27221

[5] http://www.kiplinger.com/retirementreport/features/archives/2006/10/Cover_Oct2006_02_01.html

In addition to these key features, additional transparency of these funds would potentially make them more attractive. FOLIO*fn* has developed a set of model portfolios of ETFs that cover a wide range of risk tolerance levels. By combining these portfolios in sequence with investor's age, it is possible to get the benefits of target date funds while avoiding the most common problems.

Why Use These Folios?

The **Target Date Folios** are designed for investors who want to own well-diversified portfolios that can easily evolve in terms of risk profile as they age. These portfolios remedy the core issues that many retail investors face in saving for retirement: too little diversification and inappropriate risk tolerances[6]. These asset allocations can also be tailored by investors to their specific needs.

How These Folios Work.

These Folios were designed using portfolio theory and a forward-looking assessment of the risk, return, and diversification benefits afforded by a broad set of ETFs. By combining asset classes which tend not to move together (i.e., which have exhibited fairly low correlation), it is possible to generate the highest available return for a given level of risk. We have designed a series of these Folios that cover the range of risk levels that are appropriate for most investors. The building block portfolios are then used to create a target date plan with declining risk as investors approach the target date, often retirement age. Investors can choose between moderate, conservative, and aggressive plans and can tailor these model plans to fit their specific needs.

Target Date Folios: A Better Approach

The starting point for an improved target date fund is an asset allocation that provides maximum diversification benefits. Modern portfolio theory lays the groundwork for building a well-diversified portfolio. Combining asset classes that work well together is the essence of diversification. In statistical terms, this means that combining assets that have the lowest possible correlation to one another. With a well-designed portfolio, major declines in any single asset or sector has limited impact on the total portfolio. A well-designed target date portfolio can provide investors with the benefits of effective diversification: higher return, without an increase in risk.

To build a solution with the lowest possible expenses, a target date portfolio should be made up of individual stocks. Exchange Traded Funds (ETFs) are a reasonable alternative for keeping costs low and further increasing diversification and exposure to certain asset classes. For some investors (particularly those with lower levels of investable assets), it may be worth incurring the asset based expenses of ETFs to make the creation and management of a portfolio a little easier. For larger investors, direct individual stock ownership is more cost effective. The Folio Investing platform is very

[6] See article cited in Footnote 1

efficient for both types of investor. For our first generation of target date portfolio solutions, we have used an ETF only approach.

A target date fund shifts an investor's asset allocation as he/she ages. Our first task is to design broadly diversified portfolios of ETFs at a range of risk levels—we call these our ***building block portfolios***. There are seventeen of these building block portfolios, each one adjusted to generate the most return available on a forward-looking basis, using a pre-selected set of ETFs.

In Part I, we will discuss how the building block portfolios are created and why they are a reasonable choice. In Part II, we will discuss the design of the 'glide path,' the trajectory of asset allocations over time.

Part I: Building Highly Diversified Portfolios

We have analyzed an array of ETFs to find a set of asset classes that provide the best diversification benefits, when combined in a single portfolio. The core set of ETFs that we have chosen is shown below:

ETF Ticker	Asset class
TIP	TIPS
AGG	Bond Index
IVV	S&P 500
IWM	Russell 2000
EFA	MSCI EAFE
EEM	Emerging Markets
RWR	REIT's
DJP	Commodities
COY	High Yield Bonds
EWJ	Japan Index
EWM	Malaysia Index
IGE	Natural Resources
IXJ	S&P Global Healthcare
IYE	U.S. Energy
IYT	Dow Jones Transportation Index
IYZ	Dow Jones U.S. Telecom
XLU	Utilities SPDR

ETFs used to build our well-diversified building block portfolios

These ETFs provide coverage for a number of broad market indexes, as well as explicit exposure to certain sectors that provide diversification benefits relative to these market-capitalization based indexes. We have also included exposure to commodities via DJP, as well as to energy-focused stocks via IYE and IGE. Bond exposure is provided by

AGG, TIP, and COY. TIP, an ETF of Treasury Inflation Protected Securities (TIPS), provides protection against the erosive influences of inflation on purchasing power. The allocation to REIT's, commodities, energy, and utilities also tend to provide protection from inflation.

The allocations to each of these ETFs is primarily determined by the extent to which they work well together in a portfolio to generate the most return for a given level of risk.

We examine portfolios using both historical performance and by using a forward-looking statistical model to make projections. The forward-looking model generates statistical estimates of the future risk and return of a portfolio. We discuss this process in two examples below.

The portfolio of ETFs that matches the projected volatility of the S&P500 at 15% per year (on a going forward basis) is shown below:

ETF Ticker	Asset class	Percentage of Funds
TIP	TIPS	10%
AGG	Bond Index	4%
IVV	S&P 500	0%
IWM	Russell 2000	10%
EFA	MSCI EAFE	0%
EEM	Emerging Markets	10%
RWR	REIT's	7%
DJP	Commodities	8%
COY	High Yield Bonds	0%
EWJ	Japan Index	11%
EWM	Malaysia Index	4%
IGE	Natural Resources	6%
IXJ	S&P Global Healthcare	0%
IYE	U.S. Energy	0%
IYT	Dow Jones Transportation Index	13%
IYZ	Dow Jones U.S. Telecom	3%
XLU	Utilities SPDR	14%

Building block portfolio with projected 15% Standard Deviation in return

This portfolio of ETFs has provided annual returns about 3% per year higher than the S&P500, at the same level of risk as the S&P500 over the three year period through September 2007 (when this portfolio was designed). Further, the projected expected return calculated using a forward-looking statistical model, yields about this same incremental benefit. The projected (i.e., expected) return for this portfolio is 11.4% per

year, with a standard deviation of 15% per year, generated from the forward-looking model.

The projected return for a well-diversified portfolio at this level of risk is remarkably similar to forward-looking statistical analysis generated by Ibbotson Associates[7], with a few notable differences. Ibbotson's analysis, using a Black-Litterman approach, yielded a projected return of 11.3% per year at a standard deviation of 15% for major index exposure (Figure 17 in that article—see Footnote 5 below). The portfolio that provided this return has about 18% each in commodities and U.S. stocks, and 57% in international stocks. Our portfolio has 40% in U.S. stocks and 8% in commodities, with an additional 6% in IGE, which invests in equities of firms in the energy markets. The Ibbotson model portfolios do not include REIT's as a distinct asset class.

What does it mean that our projected return is so close to Ibbotson's results for this level of risk? The point here is that well-designed forward-looking models actually have a reasonable degree of agreement in terms of projected portfolio performance. In particular, we believe that this level of projected return (i.e. forward-looking) is the best that one can realistically plan for by investing in broad asset classes (i.e. via ETFs).

David Swensen, the Chief Investment Office for Yale University's endowment stated in a recent interview that he was targeting an expected return of 10.1% per year, with a standard deviation of 11.8%[8]. This is less risk than the portfolio above. One of our building block portfolios of ETFs has a projected standard deviation of 11.8% (we were aiming at 12%--the closeness of the actual value is coincidental). It is projected to have a return of 9.8% per year. The portfolio weights are shown below.

[7] http://corporate.morningstar.com/ib/documents/MethodologyDocuments/IBBAssociates/Commodities.pdf
[8] http://registeredrep.com/investing/altinvestments/finance_illiquidity_beautiful/

ETF Ticker	Asset class	Percentage of Funds
TIP	TIPS	25%
AGG	Bond Index	5%
IVV	S&P 500	9%
IWM	Russell 2000	11%
EFA	MSCI EAFE	0%
EEM	Emerging Markets	2%
RWR	REIT's	7%
DJP	Commodities	9%
COY	High Yield Bonds	0%
EWJ	Japan Index	6%
EWM	Malaysia Index	4%
IGE	Natural Resources	3%
IXJ	S&P Global Healthcare	0%
IYE	U.S. Energy	0%
IYT	Dow Jones Transportation Index	6%
IYZ	Dow Jones U.S. Telecom	3%
XLU	Utilities SPDR	10%

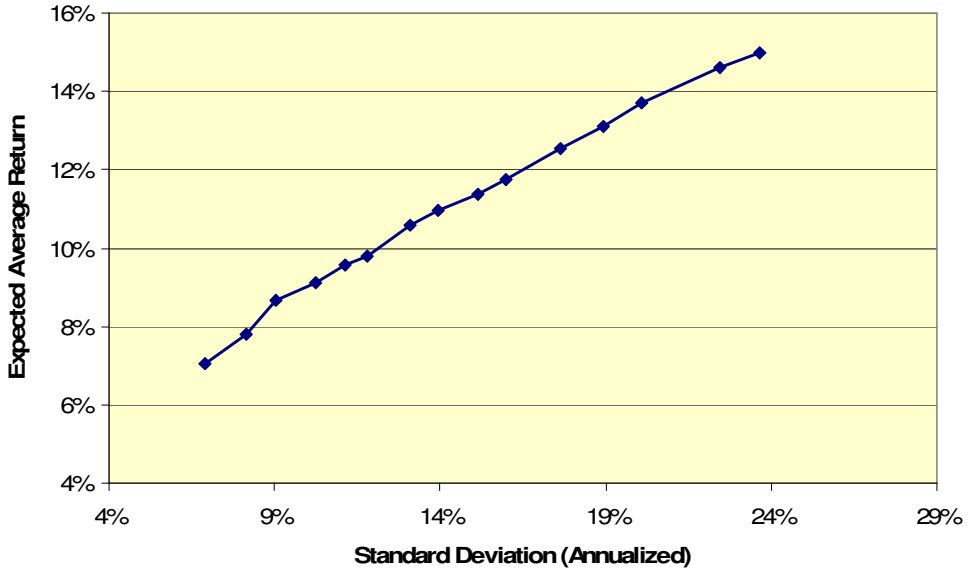
Building block portfolio with projected 11.8% Standard Deviation in return

Note that in both of the above cases, the forward-looking model was run will all default parameters—no adjustments were made to generate closer agreement to either Ibbotson's or Swensen's results.

So, what conclusions do we draw from these two cases? We have discussed just two of the seventeen ***building block*** portfolios. These portfolios use ETFs to generate the best expected return for a specific level of risk using a forward-looking analysis. There is limited use of forward-looking models outside of the institutional investment world, but these models generate fairly consistent results in terms of what can be realistically achieved with better asset allocation strategy. The building block portfolios that are used in our target-date folios use ETFs to generate the most return for each level of risk.

The core idea in portfolio theory is that it should be possible to combine a range of investments to provide the maximum available return for a given level of risk. The curve that shows the best return possible at each risk level is called ***the efficient frontier***. This approach tends to fail when allocation is driven by historical data because the resulting portfolio is invariably over-weighted to the asset classes that have out-performed in the chosen historical period. Forward-looking models overcome this problem by generating estimates of future risk and return for each asset class. The big question with regard to forward-looking models is whether they have any real predictive value. While this question can only be answered in a limited fashion, it is certainly encouraging if a range of different models generate efficient frontier that are similar—and that is what we have

shown here (albeit with just two examples, but there are a range of others[9]). The continuum of return vs. risk for our building block portfolios (including the two that we have already discussed) is shown below.



Expected return and standard deviation for building block portfolios

With these quasi-optimal ***building block portfolios*** developed, we can then create equity glide paths over an investor's career that step from one building block portfolio to another. The form of the projected glide path in time will naturally be defined in terms of projected standard deviation in return for a portfolio.

Before continuing, a note of caution: statistical projections of risk and return are based on a range of assumptions about the future risk, return, and correlations between asset classes. These may or may not be borne out in the future. That said, it is clearly the intent of target date strategies to develop a series of asset allocations that will provide the available diversification benefits to investors at a range of risk levels. We believe that the approach laid out here is a reasonable and conservative solution within the limits of the assets considered as candidates for the portfolios.

Part II: The Equity Glide Path

In this section, we will tackle the second critical piece of target date funds: how they shift the asset allocation as an investor approaches his/her retirement age. All target date funds follow some form of what is called ***the equity glide path***. The equity glide path is a gradual shift in the portfolio over time, so that it becomes more conservative with increasing age. The form of the equity glide path is determined by a variety of assumptions about investor needs and investor behavior.

[9] http://www.quantext.com/RiskReturn2.pdf

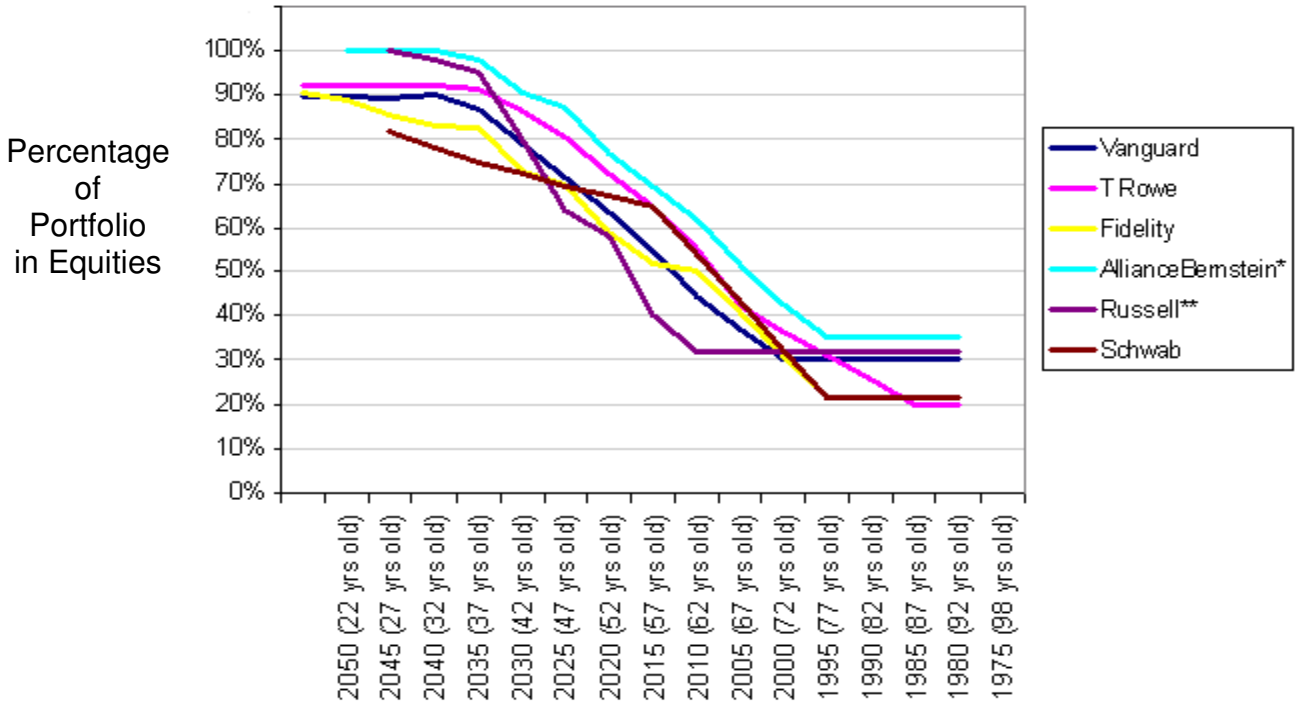
There is a simple concept beneath most equity glide paths called the ***human capital model (HCM)***[10]. The HCM assumes that each person has two sources of wealth: (1) the ability to work and to generate earnings (human capital), and (2) investments in securities and other financial assets. When a person is young, most or all of his/her wealth is in the form of human capital. As he/she gets older, the store of human capital is depleted and the store of financial assets grows. The key idea in HCM is that the flow of earnings from human capital is fairly steady (some even say ***bond-like***) and is generally uncorrelated to the stock market. In essence, the young worker owns a portfolio that is almost entirely bond-like because the vast majority of his/her wealth is in the form of human capital. Naturally, any investments in financial assets will be aggressive because the human capital form of the portfolio is a bond-like asset. As the investor ages, more of his/her wealth is in the form of financial assets and human capital is depleted—so more of the financial assets are placed into bonds. This idea is certainly intuitively reasonable.

Another way to motivate the equity glide path is to think in terms of confidence of reaching a specific financial goal. Imagine that you are planning to retire at age 65 and you have plans that require that you have a certain amount of wealth in your portfolio when you reach that age. As you move closer to your retirement age, you have a decreased amount of future earnings to offset swings in the value of your financial assets. To manage the potential impact of market volatility on the value of your portfolio at retirement, it simply makes sense for the portfolio to become more conservative as you age (i.e. lower risk / lower return). The logic of this hinges on the key variable being the ability to manage uncertainty in wealth level at the date of retirement—often explained in practical terms with the idea that a new retiree will want to purchase an immediate annuity[11]. This conceptual foundation is used by Russell for their target date funds[12].

But what if we think about retirement in a different way? What if your concern is not specifically about having a certain level of wealth at retirement age in order to purchase an annuity? Many investors plan to have their portfolios provide a specific level of income via dividends and capital growth. For these investors, the best portfolio is different. An investor who wishes to maintain his/her portfolio for the long term and draw income from the portfolio will tend to end up with a substantially more aggressive allocation because his/her main risk is not generating sufficient investment returns to support a long retirement. This investor has more years to be in the market. This conceptual model is used by Alliance Bernstein in the design of their target date funds[13].

[10] See article cites in Footnote 3
[11] See article cited in Footnote 3
[12] Detailed in the article in Footnote 4
[13] Detailed in the article in Footnote 4

The Russell target date funds are far more conservative that the Alliance Bernstein target date funds, largely because they have started from different conceptual foundations about investor needs and choices (see chart below).



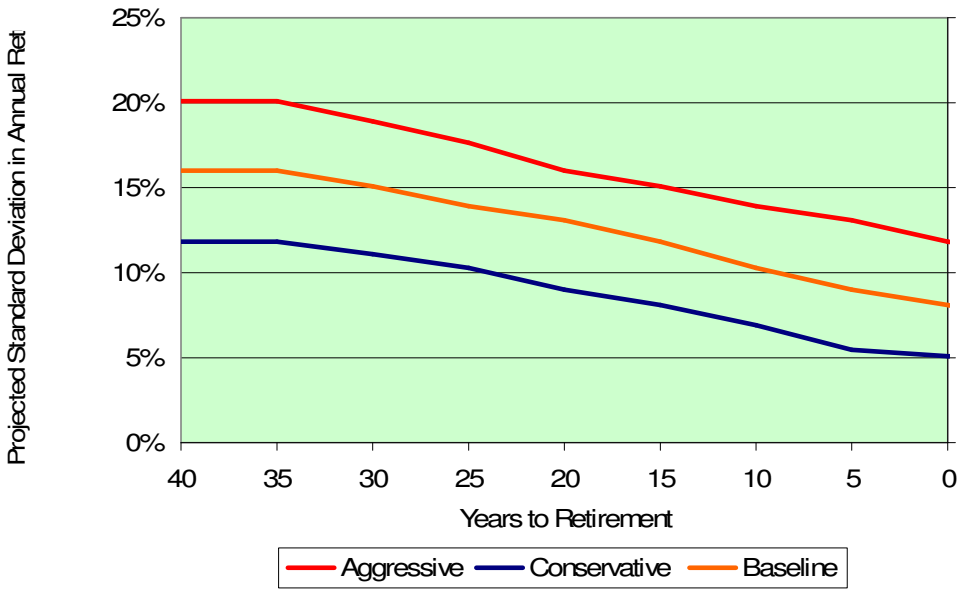
- ALLIANCE BERNSTEIN'S PORTFOLIOS INCLUDE A 10% REIT EXPOSURE, WHICH WE HAVE GROUPED TOGETHER WITH THE EQUITY PORTION.
- ** RUSSELL PORTFOLIOS INCLUDE A 7% REIT EXPOSURE, DECLINING TO 3% OVER TIME, WHICH HAS BEEN GROUPED TOGETHER WITH THE EQUITY PORTION.

Source: Smartmoney[14]

This chart shows the percentage of the portfolio invested in equities as a function of retirement age / year. The Alliance Bernstein target date funds have about 60% of the portfolio invested in stocks at age 65 (i.e. 40% bonds), while the Russell target date funds have only 30% invested in equities at age 65—and this difference is largely due to their focus on the two different conceptual models of the goals to be met. Even the large differences in equity allocation shown in the chart above don't capture the full differences between target date funds. There are many ways to build the equity portion of the portfolio. How much domestic? How much foreign? How much emerging markets? What portion of total assets is devoted to inflation protection? This last question has been examined in a white paper by PIMCO[15].

[14] http://www.smartmoney.com/fundinsight/index.cfm?story=20070206&pgnum=2
[15] http://www.pimco.com/LeftNav/Viewpoints/2007/Glidepath+Paper-+8-2007.htm

Clearly, there is general agreement that investors should become more conservative as they age. The problem is that the experts do not agree on what the equity glide path should look like. Our analysis of the design of the glide paths suggests that the differences reflect different assumptions about investor behavior and about the future risks and returns from various asset classes. The range in assumptions and design of target date funds leads to the question of how investors should choose between these different strategies. One way to solve this conundrum is to provide investors with a range of possible pre-built glide paths, as well as providing the capability to customize the glide path. In designing a set of pre-built portfolios of ETFs that can form the core of a target date strategy, we have developed three basic glide paths (shown below).



FOLIOfn Model Glide Paths

These are shown in terms of projected standard deviation in annual return (vertical axis), which is the core measure of risk that investors should worry about. A standard deviation of 15% is a fairly standard forward-looking estimate of the volatility of the S&P500, for example.

In creating a series of 'one click' portfolios that investors can purchase, FOLIO*fn* has mapped the building block portfolios onto these glide paths. If you want to purchase the model portfolio designed for a moderate investor with thirty years to retirement, you will end up with one of the ***building block*** portfolios explained in the previous article. FOLIO*fn* will contact you by email to tell you to check up on your portfolio when the model allocations shift to a different building block portfolio.

The model glide paths shown above were developed using a hybrid of the two extreme approaches described earlier: the assumption that the investor will buy an annuity at retirement vs. the assumption that the investor will draw income from the portfolio

through retirement[16]. The theory developed to motivate the form of equity glide paths is under development and there is still much room for debate, as evidenced by the very large range of glide paths espoused by the various fund families.

Ultimately, investors should understand that any equity glide path contains a range of assumptions that may or may not apply specifically to them. A target date model is made up of a series of asset allocations that change with age (and risk tolerance, as above). The first thing to make sure of is that the underlying portfolios make sense for your specific needs. We have explained FOLIO*fn*'s specific model for developing the underlying portfolios in the previous article. By combining ETFs using forward-looking asset allocation models, we have come up with a set of building block portfolios that exploit available diversification benefits in a cost effective manner.

Asset allocation models have uncertainty in their assumptions---models are approximate. That said, a broadly diversified portfolio of ETFs makes sense in terms of general principles. Assuming that investors make choices in terms of risk levels that are within the risk bounds shown in the previous chart, the resulting portfolio of ETFs that they end up with should be better than the types of asset allocations that many investors choose. Finally, while we provide basic glide paths, we are in no way saying that choosing a generic target date glide path will be the best solution for any person. Part of the motivation for FOLIO*fn*'s approach to target date strategies was to empower investors and advisors to design their own personalized 'glide paths' without having to start from scratch. It is straightforward for investors and advisors to choose from among the building block portfolios, and change these choices over time.

About FOLIOfn and Quantext

FOLIO*fn*'s unique, patented Folio Investing offering (www.folioinvesting.com) represents the next generation in investing, after mutual funds and Exchange Traded Funds (ETFs). Folio Investing enables investors both to create their own Folios, much like creating a personalized ETF or mutual fund, or choose from many Ready-To-Go Folios representing different market indices, sectors, geographies, asset classes and investment strategies. Folios provide significant tax efficiencies, customization, and transparency, while allowing for cost-effective diversification. Folios can hold individual stocks, mutual funds, and ETFs. Folios can be managed or unmanaged and are offered by FOLIO*fn* Investments, Inc, a registered broker dealer, and are not registered investment companies.

FOLIO*fn*'s comprehensive, state-of-the-art institutional platform (www.folioadvisor.com) is used by more than 150 registered investment advisory firms, brokerages and financial institutions. FOLIO*Advisor* integrates advanced technology and clearing brokerage capabilities and is offered through FOLIO*fn* Institutional, a division of FOLIO*fn* Investments, Inc. FOLIO*Advisor* utilizes the proprietary and patented FOLIO

[16] Research document with details is available from FOLIO*fn*

trading platform in an easy-to-use, Web-based trading system that enables advisors and institutions to customize portfolios of securities (Folios) that can be bought, modified and sold in a single transaction across thousands of clients and accounts.

Quantext is an independent firm that acts as a strategic adviser to FOLIO*fn*, Inc.