

Improving the “Target” in Target-Date Investing

BY DAVID M. BLANCHETT AND
GREGORY W. KASTEN

While target-date mutual funds are an improvement over participant-directed investing in 401(k) plans, they are not the ideal participant asset allocation solution. The “one-size-fits-all” approach to target-date investing ignores the funded status and risk tolerance preference of individual 401(k) participants. The research conducted for this article suggests that a managed account platform with

David M. Blanchett, CFP[®], CLU, AIFA[®], QPA, CFA, is the director of consulting and investment research for the retirement plan consulting group at Unified Trust Company, NA, in Lexington, KY. Unified Trust Company is a nationally chartered trust company that specializes in the fiduciary management of retirement plans. Mr. Blanchett has an MS in Financial Services from the American College and an MBA from the University of Chicago Booth School of Business.

Gregory W. Kasten, MD, MBA, CFP[®], CPC, AIFA[®], is founder and CEO of Unified Trust Company, NA. Unified Trust serves as fiduciary for over \$2 billion of client assets. Dr. Kasten has 25 years of investment and ERISA experience. He is a Certified Pension Consultant, a Certified Financial Planner, and an Accredited Investment Fiduciary Analyst. Dr. Kasten received an MBA from the University of Kentucky, and a Doctor of Medicine from Southern Illinois University.

multiple glidepaths (e.g., Conservative, Moderate, and Aggressive), where participants’ allocations are dynamically updated based on their funded status, leads to 30% less account dispersion at retirement and 10% higher probability of achieving retirement success when compared to using single target-date glidepath series.

In theory, an investor should only purchase a “targeted” investment if the “target” matches that investor’s goal. Not surprisingly, the “target” of target-date investments, such as the Fidelity Freedom 2020 Fund, is the expected date of retirement for the investor (hence the name). While the “one-size-fits-all” approach in target-date investing is an improvement over participant directed-investing, target-date investing is by no means the ideal participant asset allocation solution. The true “target” of any participant level investment policy should be to maximize the likelihood of achieving the goal (i.e., retire successfully) with the least amount of risk, something that target-date investments by their very nature are unable to do.

A key premise of this paper is that, if a participant is on track to retire successfully (which for the purposes of this article is defined as replacing 70% of pretax income in retirement), he or she should take on as little risk as necessary in order to fund the retirement goal (i.e., minimize the potential dispersion of the account balance at retirement). The fundamental concept is that achieving the goal should be the goal. A strategy that generates assets above the required liability is fine, so long as generating the assets does not come at the expense of increasing the risk that the goal may not be achieved. This paper will test the benefit derived from introducing multiple glidepaths (Conservative, Moderate, and Aggressive) and determine the benefits derived from dynamically moving participants among these glidepaths based on their funded status.

The Target-Date Environment

To become invested in a target-date mutual fund in a 401(k) environment, a participant will either select the appropriate target-date fund (among the plan’s core investment menu) based on his or her expected retirement date, or will be defaulted into a target-date fund based on the participant’s birth date (which is used as a proxy for the expected retirement age).

Recent legislation such as the Pension Protection Act has led to a substantial increase in target-date investing with the introduction of Qualified Default Investment Alternatives (QDIAs). According to a Summary of Committee Research Report prepared by the Majority Staff of the Special Committee on Aging (prepared on October 2009), 96% of plans that offer the automatic enrollment feature are using target-date funds as the default investment. The percentage of Vanguard's defined contribution plans offering target-date funds increased from 13% of plans in 2004 to 75% in 2009, according to a recent study conducted by the company.

While target-date investing (via target-date mutual funds) is an improvement over participant-directed investing, where participants individually determine the asset allocations of their own accounts, target-date funds are not without their faults. First, target-date mutual funds are typically created entirely from the mutual funds of the sponsoring organization. For example, Fidelity's Freedom Funds are built from Fidelity's proprietary mutual funds. While it is possible for some 401(k) platforms to create target-date portfolios from the investments in the plan (i.e., from a variety of fund families), this is not common.

Second, target-date funds tend to be used in conjunction with other plan investments and not as a one-off solution, as is intended. Most target-date investments look like "black boxes" to participants and target-date funds generally contain investments not available as standalone options in the core menu. Without proper guidance (and constant reminding), participants tend to inappropriately combine target-date funds with other plan investments. If not used properly, the potential asset allocation benefits from the target-date investments can be virtually eliminated.

Third, target-date funds are notoriously difficult to compare on an "apples-to-apples" basis for benchmarking purposes. While Morningstar recently expanded the target-date fund categories into more distinct groups based on target-date (e.g., the Target Date 2016–2020 Morningstar Category), there are considerable differences in allocation methodologies across providers, which makes target-date funds difficult to compare in terms of quality, risk, and expected return.

Fourth, the costs of target-date funds do not tend to vary in cost with plan size (i.e., larger plans pay the same as smaller plans). A recent study by BrightScope, Inc. found that target-date funds have internal fees

that are between 10% to 25% more expensive than other funds offered on the core menu.

Fifth, the single glidepath approach to target-date investing—that is, the assumption that the split between equities and fixed income securities in a portfolio should be the same for all individuals of a given age—ignores the possibility of investors with varying risk preferences. There is such a thing as a conservative 30-year-old and an aggressive 60-year-old; yet, in a single glidepath environment, everyone the same age has the same equity allocation, regardless of risk tolerance. A better approach would be to offer portfolios with varying risk characteristics, such as multiple glidepaths or risk-based portfolios, where investors can select a portfolio that is more consistent with their risk tolerance.

The Asset Allocation Decision

The asset allocation policy of a target-date investment is typically described through its "glidepath" or lifetime equity allocation. The glidepath is the lifetime equity allocation of a target-date investment, or a term used to describe the gradual shift in portfolio allocation from equities to fixed income with an investor's age. The glidepath ends at the "landing point," which is where the target-date investment reaches its most conservative asset allocation and no longer adjusts its asset allocation.

The importance of the strategic asset allocation decision is well known and generally accepted among investing professionals. Brinson, Hood, and Beebower [1986] provided the most well-known (and often misquoted) statistic that asset allocation explained 93.6% of the variation in the 91 large U.S. pension plans tested. In a recent piece by Xiong, Ibbotson, Idzorek, and Chen [2010] the authors note that, because active management is a zero-sum game, 100% of return level on average comes from the asset allocation policy. The study confirms previous findings by Ibbotson and Kaplan [2000].

Despite the wide acceptance of the importance of asset allocation, research has consistently shown that the average 401(k) participant makes poor asset allocation decisions. For example, Mottola and Utkus [2007] reviewed the allocations of approximately 2.9 million participants at Vanguard and found that only 43% of participants had "green" portfolios with balanced exposure to diversified equities, while 26% of participants had "yellow" portfolios, which were either too aggressive or too conservative, and 31% of participants had "red" portfolios with either no

equities or a high concentration of employer stock. Additional research by Hancock, Kasten [2005], and Munnell [2006], among others, has also noted that participants tend to underperform the managed portfolio options.

There are considerable differences in the "glide-paths" of the various target-date mutual fund providers. This is depicted visually in Figure 1, which includes the 5th percentile (most conservative one in 20), median (50th percentile), and 95th percentile (most aggressive one in 20) equity allocations in target-date mutual funds with target dates ranging from 2010 to 2050 in five-year increments as of December 31, 2009. Data was obtained from Morningstar as of December 31, 2009, and for data integrity purposes all funds with equity allocations less than 20% were removed from the test population. Funds with multiple share classes were limited to a single Morningstar Fund ID. For those funds with multiple share classes, the fund with the oldest inception date is used. For those funds with multiple share classes and the same oldest inception date, the fund with the lowest expense ratio is used.

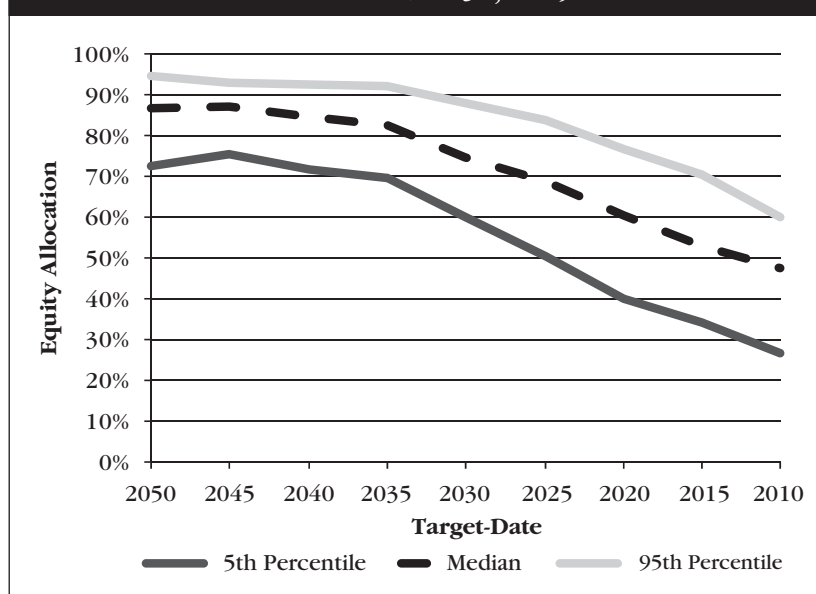
Given the varying equity allocations across providers, it is not surprising that the returns within the same target-date category can vary materially. This variation was especially pronounced during the calendar year 2008, when the S&P 500 returned -37%. Most 401(k) investors and their advisors would have

expected the more conservative 2010 target-date mutual funds (i.e., those funds that gear towards participants retiring in two years) to fare reasonable well in 2008; however, as exhibited in Table 1, which includes the return of select 2010 target-date mutual fund providers, this was not the case.

Table 1. Returns for Selected 2010 Target-Date Mutual Funds in 2008

Ticker	Fund Name	2008 Return
OTTAX	Oppenheimer Transition 2010 A	-41.32%
LTDAX	Alliance Bern 2010 Retirement Strat A	-32.88%
GRCAX	Goldman Sachs Retirement Str 2010 A	-30.78%
JLAAX	John Hancock2 Lifecycle 2010 A	-29.82%
AAATX	American Funds 2010 Target Date R	-27.45%
FFFCX	Fidelity Freedom 2010	-25.32%
PARAX	T. Rowe Price Retirement 2010 A	-26.88%
VTENX	Vanguard Target Retirement 2010	-20.67%
Average All 2010 Funds		-23.97%

Figure 1. Equity Allocation Range for Target-Date Mutual Funds as of December 31, 2009



Source: Morningstar

The median equity allocation (domestic and international) for 2010 target-date portfolios as of December 31, 2009, was 45%. A “naive” portfolio invested 45% in the S&P 500 Index and 55% Barclays Aggregate Bond Index would have returned approximately -14% in 2008, while a portfolio invested 60% S&P 500 and 40% Barclays Aggregate Bond Index would have returned approximately -20% in 2008 (both above the Category Average for the year). Not surprisingly, there was significant public backlash against the target-date mutual fund industry due to the poor performance of these funds.

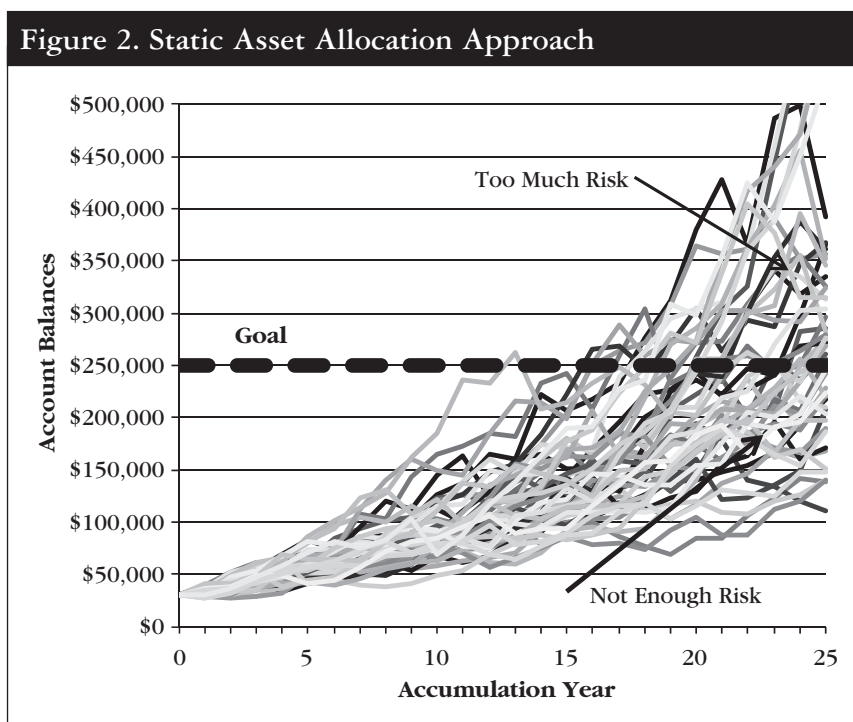
A recent study conducted by Janus Capital Group titled “The Burden of Good Intentions: Opportunities and Challenges for Target-Date Funds” (available through Janus’s Web site) concluded that many participants do not sufficiently understand target-date funds (or how to use them) and that investor education about target-date funds has been inadequate and ineffective. Target-date investments are a great “theory” to improve participant investing, yet the actual realization of these benefits has been questionable.

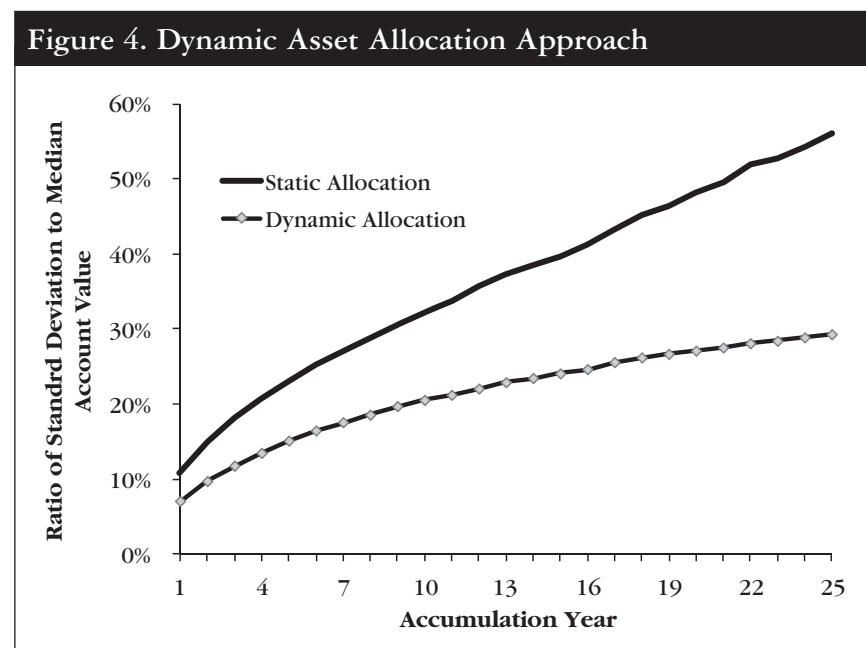
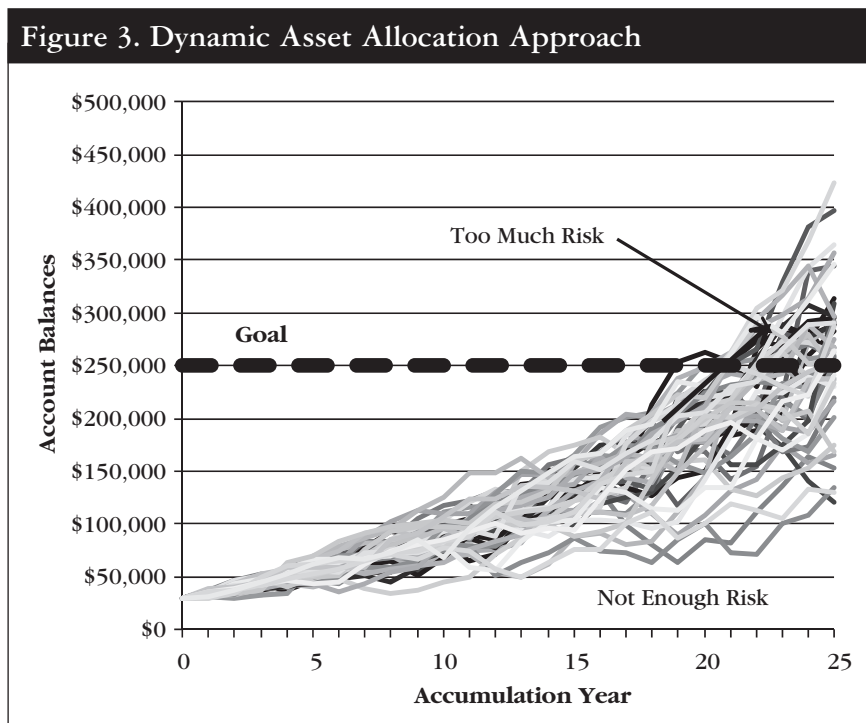
Thinking About Risk

The current structure of target-date investing ignores perhaps the most important aspect of a participant’s situation: funded status (i.e., the likelihood of being able to retire successfully). The authors contend that a participant who is on track to retire

successfully should take on less risk than a participant who is poorly funded. This is a concept discussed in a recently released Vanguard Commentary written by Paul Bosse [2010] that introduces the “Dynamic Investment Policy Statement” (Dynamic IPS), where the funding status of a client is used as the key driver of portfolio asset allocation. Bosse notes, “a Dynamic IPS provides a structure that recommends portfolio adjustments when certain funding levels are reached. For example, a trigger could be set up so that when the funding ratio hits 100%, the equity ratio will be dropped 20 percentage points.”

The potential benefit of a dynamic approach to asset allocation is demonstrated visually in **Figure 2** and **Figure 3**, which include the first 50 runs from a 10,000-run Monte Carlo simulation that are each based on the same annual stock and bond returns; the only difference in the figures is the underlying allocation to stocks or bonds. Figure 2 assumes a static allocation approach, where the account is invested in a 60/40 portfolio (60% equity and 40% bond) for the entire accumulation period. Figure 3 assumes a dynamic asset allocation approach, where the account is invested in either a 20/80 portfolio (20% equity and 80% bond) or a 100/0 portfolio (100% equity and 0% bond), based on the funded status of the participant. If the participant is on track to retire successfully, the account is invested more conservatively (in the 20/80





portfolio), while if the participant is not on track to retire successfully, the account is invested more aggressively (in the 100/0 portfolio). Note, the average equity allocation of the dynamic asset allocation approach is 60%, which is the same equity allocation as the static portfolio.

Not surprisingly, the dynamic asset allocation results in a much tighter spread (or dispersion) of the

potential account values at retirement. The standard deviation of the account balances at retirement for the Static Asset Allocation approach is 57.91% versus 29.09% for the Dynamic Asset Allocation approach. This concept is displayed visually in **Figure 4**, which shows the dispersion of account balances through the accumulation period for the Static and Dynamic Asset Allocations.

The probability of achieving the goal increases from 64.44% with the Static Asset Allocation approach to 76.74% with the Dynamic Asset Allocation. In other words, an investor using this dynamic strategy would not only have a higher likelihood of achieving a goal, but also less risk associated with the outcome, which should be the goal of any investing approach. For investors who would be uncomfortable moving between equity allocations of 20% and 100%, a more conservative band can be used for implementation.

Analysis

To determine the potential benefit from adding additional glidepaths for target-date investors and dynamically moving participants between the glidepaths based on their funded status, an analysis was conducted. The three glidepaths tested are the same as those depicted in Figure 1, where the 5th percentile glidepath equity allocation is deemed to be the “Conservative” glidepath, the median percentile glidepath equity allocation is deemed to be the “Moderate” glidepath, and the 95th percentile glidepath equity allocation is deemed to be the “Aggressive” glidepath. These glidepaths are based on actual target-date mutual fund equity allocations as of December 31, 2009, and are not glidepaths formulated by the author. Because equity allocations are not available for the nontarget-date years (i.e., 2011, 2012, 2013, etc.), a second order polynomial trendline was fit to each of the series (each trendline had

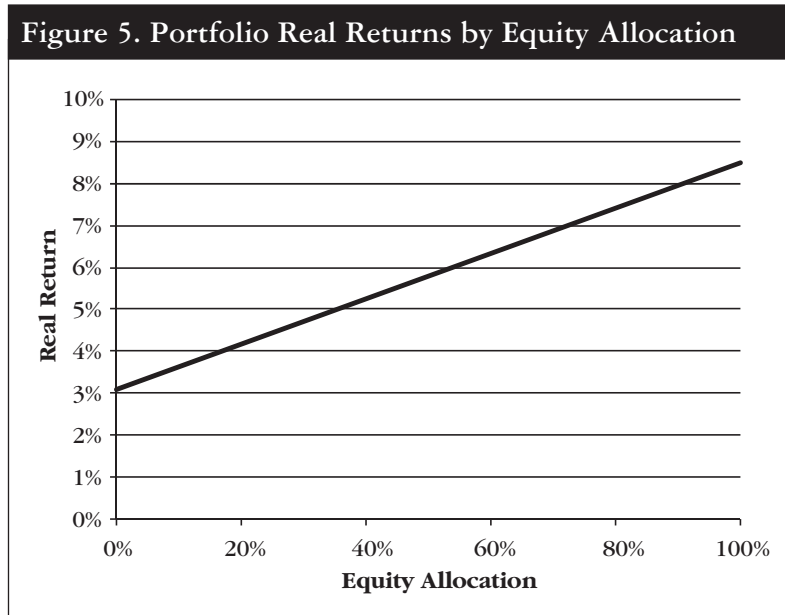
an R^2 value above .99 when regressed on the actual data series).

Returns for the three glidepaths for testing purposes were based on monthly data from a two-asset portfolio consisting of the S&P 500 index (data obtained from Ibbotson), which represents the equity piece, and Ibbotson’s Long-term Corporate Bond Index, which represents the fixed piece. The monthly returns were converted into “real” terms by reducing the returns by the monthly increase in the Consumer Price Index. Converting return values into real (versus nominal) returns eliminates the need to consider inflation (since it is accounted for in the reduced returns) and puts everything in constant dollars. The annualized returns, annualized standard deviations, and correlation for the two proxies are included in Table 2 as a reference, while the real returns for the various equity allocations (0%–100%) are included in Figure 5.

Three primary scenarios were tested: one where the participant is underfunded (i.e., not on track to retire successfully), one where the participant is moderately funded (i.e., on track to retire successfully), and a third where the participant is overfunded (i.e., on track to

Table 2. Portfolio Statistics

	S&P 500	LT Corp Bond
Annual Real Return	8.50%	3.10%
Standard Deviation	19.30%	7.80%
Correlation	0.23	



Source: Ibbotson

retire more than successfully). More scenarios could have been considered, but the relative benefit of using multiple glidepaths and dynamically moving a participant between them based on funded status becomes evident using these three examples. Note, using more extreme examples (e.g., where the participant is either materially more or materially less funded) would only make the discrepancies (i.e., benefits) from multiple glidepaths larger.

For each of the three test scenarios, the participant is assumed to have 25 years until retirement. The current account balance and annual savings rate vary across scenarios. For each scenario, the assumed goal is for the participant to achieve a funded ratio of one. For those readers not familiar with the funded ratio, it is the projected assets at retirement, divided by the expected need (or liability). A funded ratio of one or greater implies that that participant is on track to have enough assets to retire successfully.

The participant is assumed to earn \$50,000 per year, and it is assumed that he will need to replace 70% of his pretax income in retirement (\$35,000 per year). The assumed monthly Social Security benefit is \$1,500 (\$18,000 per year), leaving a \$17,000 annual pretax income benefit that needs to be funded from the 401(k) account. Assuming the participant wants to fund a benefit period of 30 years, based on a 5.26% discount rate (the return of the 40/60 portfolio), the expected liability (or retirement need from the 401(k) account) is approximately \$250,000. Note, this \$250,000 figure (i.e., the liability) is based on a simple (deterministic) present value calculation, which can generally be associated with a 50% probability of success.

The account balances at retirement are determined using a 10,000-run Monte Carlo simulator built by one of the authors in Microsoft Excel. Within the simulator, the expected annual return and standard deviation of the glidepaths change each year based on the expected annual return and standard deviation assumptions for that glidepath for the year. To determine the "optimal" glidepath among the three tested, the "Selection Ratio" is introduced. This metric was created to remove the somewhat arbitrary nature of selecting the "best" glidepath for a given scenario.

In terms of calculation, if the participant (or Monte Carlo run) has a funded ratio greater than one at retirement, the Selection Ratio is the percentage of account values yielding a funded ratio greater than one (i.e., with account values greater than \$250,000),

divided by the account dispersion, which is the standard deviation of account values in percentage terms. This is a "risk-adjusted" way to measure the outcome, where the ideal portfolio would generate an outcome in which 100% of the portfolios generated assets at retirement that fully funded with no dispersion. If the funded ratio is less than one (i.e., the participant is underfunded), the difference from the target funded ratio of one (i.e., how underfunded the account is) is multiplied by 10 and this is subtracted from the above. The idea is that achieving retirement success should be the primary goal, and the risk associated with doing so is only marginally important in comparison to retiring successfully. Or, more simply, poorly-funded participants should take on more risk, while well-funded participants should take on less.

As the reader can see in Table 3, increasing the number of glidepaths from one (i.e., Moderate) to three (i.e., Conservative, Moderate, and Aggressive) generated a modest improvement for the Underfunded and Overfunded scenarios. In Figure 6, the Selection Ratios improved both the Underfunded and Overfunded scenarios. Note, for the overfunded participant, the optimal portfolio (as defined by the Selection Ratio) was the Conservative glidepath. This was because it had a relatively similar probability of achieving a fully funded retirement benefit (61.25% versus 65.56%), but materially less risk.

Dynamic Glidepath Test

A second test was performed based on the same scenarios, except in this test the participant allocation changed based on the ongoing funded status of each run. For this test, if in a given year the participant was on track to be overfunded for retirement, the account was assumed to be invested in the Conservative glidepath. If in a given year the participant was on track to be underfunded for retirement, the account was assumed to be invested in the Aggressive glidepath. This methodology is similar to the "Dynamic IPS" approach previously introduced, where the portfolio risk changes based on the current funded status for that run. For this test, changes are made to each year for each run in the 10,000-run Monte Carlo simulation. The results of the test are included in Table 4 and the respective Selection Ratios are included in Figure 7.

The benefit from a "dynamic" glidepath approach was significant when compared to either the Moderate glidepath (i.e., the "average" target-date fund) or the "optimal" glidepath, assuming Conservative,

Table 3. Three Scenarios: The Impact of Having Three "Static" Glidepaths			
	Glidepath		
UNDERFUNDED SCENARIO*	Conservative	Moderate	Aggressive
Median Account Balance at Retirement	\$192,765	\$210,482	\$224,012
Funded Ratio (Asset/Liability)	0.77	0.84	0.90
Dispersion of Account Values	57.76%	73.70%	89.33%
% of Portfolios with Retirement Success	29.18%	38.19%	43.41%
Selection Ratio (the higher the better)	-1.78	-1.06	-0.55
	Glidepath		
MODERATELY FUNDED SCENARIO**	Conservative	Moderate	Aggressive
Median Account Balance at Retirement	\$246,417	\$270,742	\$289,440
Funded Ratio (Asset/Liability)	0.99	1.08	1.16
Dispersion of Account Values	62.87%	80.74%	98.41%
% of Portfolios with Retirement Success	48.97%	55.08%	58.33%
Selection Ratio (the higher the better)	0.64	0.68	0.59
	Glidepath		
OVERFUNDED SCENARIO***	Conservative	Moderate	Aggressive
Median Account Balance at Retirement	\$289,195	\$317,818	\$339,537
Funded Ratio (Asset/Liability)	1.16	1.27	1.36
Dispersion of Account Values	62.51%	80.18%	97.73%
% of Portfolios with Retirement Success	61.25%	65.56%	67.43%
Selection Ratio (the higher the better)	0.98	0.82	0.69

* 25 years till retirement, \$2,500 annual real savings, \$10,000 current account balance

** 25 years till retirement, \$2,500 annual real savings, \$20,000 current account balance

*** 25 years till retirement, \$3,000 annual real savings, \$30,000 current account balance

Figure 6. Selection Ratios for Static Simulation

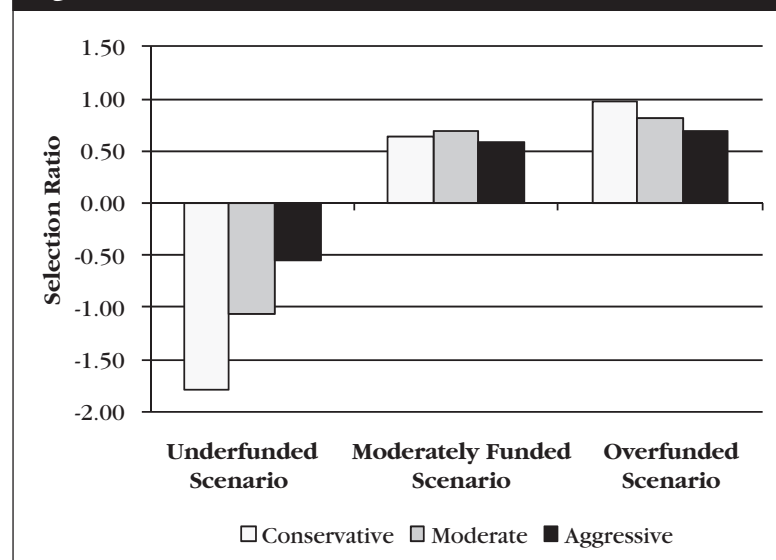
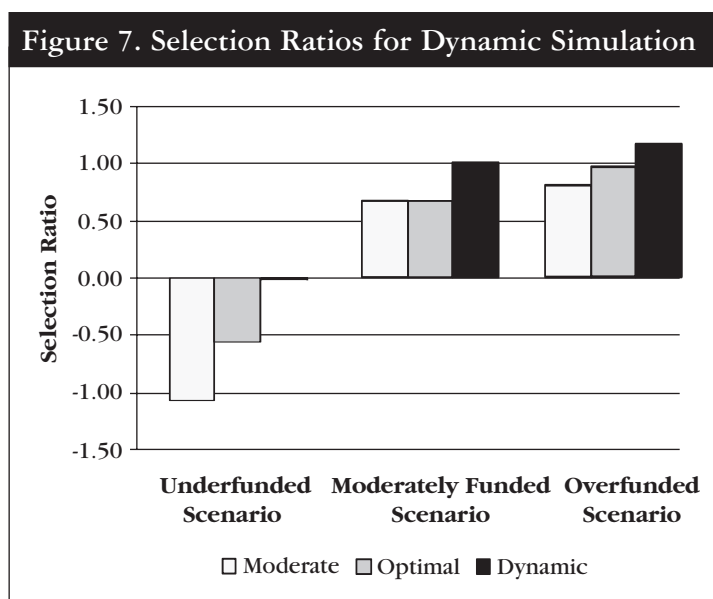


Table 4. Three Scenarios: The Benefit of a "Dynamic" Glidepath			
UNDERFUNDED SCENARIO*	Moderate	Optimal (Agg)	Dynamic
Median Account Balance at Retirement	\$210,482	\$224,012	\$231,333
Funded Ratio (Asset/Liability)	0.84	0.90	0.93
Dispersion of Account Values	73.70%	89.33%	61.27%
% of Portfolios with Retirement Success	38.19%	43.41%	45.31%
Selection Ratio (the higher the better)	-1.06	-0.55	-0.01
MODERATELY FUNDED SCENARIO**	Moderate	Optimal (Mod)	Dynamic
Median Account Balance at Retirement	\$270,742	\$270,742	\$288,232
Funded Ratio (Asset/Liability)	1.08	1.08	1.15
Dispersion of Account Values	80.74%	80.74%	59.57%
% of Portfolios with Retirement Success	55.08%	55.08%	60.22%
Selection Ratio (the higher the better)	0.68	0.68	1.01
WELL FUNDED SCENARIO***	Moderate	Optimal (Con)	Dynamic
Median Account Balance at Retirement	\$317,818	\$285,195	\$320,878
Funded Ratio (Asset/Liability)	1.27	1.16	1.28
Dispersion of Account Values	80.18%	62.51%	58.85%
% of Portfolios with Retirement Success	65.56%	61.15%	69.27%
Selection Ratio (the higher the better)	0.82	0.98	1.18

* 25 years till retirement, \$2,500 annual real savings, \$10,000 current account balance
 ** 25 years till retirement, \$2,500 annual real savings, \$20,000 current account balance
 *** 25 years till retirement, \$3,000 annual real savings, \$30,000 current account balance



Moderate, and Aggressive where available. For all three tests, the Dynamic approach had a higher likelihood of achieving retirement success and lower account dispersion at retirement. Dispersion was 30% lower on average than the Moderate glidepath, and the probability of achieving retirement success was 10% higher on average than the Moderate glidepath,

suggesting a material improvement in outcomes for a 401(k) plan adopting the approach.

Implementing a More "Targeted" Approach

The results of this analysis suggest that a more "targeted" approach to target-date investing, where a participant's asset allocation is dynamically updated

based on his or her funded status, would lead not only to a higher probability of achieving retirement success, but also to a lower account dispersion at retirement. This approach would need to be implemented through a managed account platform, where the investment manager (or trustee) has discretion to change the participant's allocations as circumstances change.

There are a number of other benefits to implementing this approach. First, it provides participants with a rudimentary financial plan. The default assumptions for any such analysis would need to be the plan-specific information (i.e., current account balance, current total savings, current allocation, where the liability is based on some percentage of current compensation), yet given the functionality of the platform, it could also be possible for the participant to provide additional information as to their situation (e.g., other outside assets) to more accurately calculate funded status.

Dynamic Allocation Based on Funded Status vs. Market Timing

One of the most interesting effects of the dynamic investment policy is that it appears to systematically improve outcomes and decrease risk, and it does so without the need for guesswork. It is similar in this respect to portfolio rebalancing, which is widely considered to be an effective and automated way to “buy low and sell high.” Dynamic allocation based on funded ratios is similar to market timing in that it varies the strategic asset allocation over time, but rather than requiring a manager to guess the best timing for allocation changes, the dynamic allocation policy bases changes on concrete, automated rules. Because funded ratios are likely to slip when markets are down and improve when markets are up, the dynamic changes introduced by use of the funded ratio should have a tendency to increase equity allocations when markets are down and decrease equity allocations when markets are up (i.e., buy low and sell high). This is precisely the goal of market timing, but a dynamic reallocation policy appears to achieve it without guesswork. It does not eliminate risk or guarantee success, but the data suggest that it improves outcomes in an automated, rules-based way that is broadly replicable.

There is a potential societal benefit to this approach: even if broadly applied by investors, it is generally not procyclical. In fact, if enough investors were to use the dynamic approach, it is possible that overall volatility would decrease—a question for further research to explore. Market timing, by contrast, is

highly procyclical in that it tends to exacerbate market volatility—faster, deeper troughs caused by too many investors hoping to sell at once.

In the wake of the 2007–2009 bear market, investor interest in alternative strategies, including market timing, was at an all-time high. Many investors felt let down by the financial industry, believing someone should have told them to sell before the market bottomed, to save them from a decline that—in the amateur investor's eyes—should have been foreseen and acted upon. The problem with this thinking is that every seller needs a buyer, and if everyone had foreseen the downturn and bailed out, there would have been no buyers. Only a handful of traders ever benefit from trades; in the aggregate, the sum of the return differences introduced by all trading activity is to reduce global returns by the amount of the transaction costs—that is, many losers, few winners, and there seems no reliable way to predict the winners. Dynamic allocation based on funded ratios provides a rational guidepost for investor behavior that may accomplish the goals of alternative trading strategies better than most traders.

Conclusion

While target-date mutual funds are an improvement over participant-directed investing in 401(k) plans, they are not the ideal participant asset allocation investment. The “one-size-fits-all” approach to target-date investing ignores the funded status and risk tolerance of individual participants. The research conducted for this paper suggests that a managed account platform with multiple glidepaths (e.g., Conservative, Moderate, and Aggressive) where participants' allocations are dynamically updated based on their funded status leads to 30% less account dispersion and 10% higher probability of achieving retirement success when compared to using a single target-date glidepath. ■

Works Cited

- Bosse, Paul, 2010, “Pensions—Dynamic IPS: A Plan for Action,” Vanguard Commentary: <https://institutional.vanguard.com/VGApp/iip/site/institutional/researchcommentary/article?File=InvResDynamicIPS>.
- Brinson, Gary P., L. Randolph Hood, and Gilbert L. Beebower, 1986, “Determinants of Portfolio Performance,” *Financial Analysts Journal*, vol. 42, no. 4 (July/August): 39–44.
- Ibbotson, Roger G. and Paul D. Kaplan, 2000, “Does Asset Allocation Policy Explain 40, 90, or 100 Percent of Performance?,” *Financial Analysts Journal*, vol. 56, no. 1 (January/February): 26–33.

John Hancock Lifestyle Portfolios Produce Better Results for 401(k) Plan Participants, http://www.johnhancock.com/about/news/news_aug1406.jsp.

Kasten, Greg K., 2005, *Retirement Success: A Complete Instruction Guide for Plan Sponsors and Their Advisors*, Second Edition.

Mottola, Gary R. and Stephen P. Utkus, 2007, "Red, Yellow, and Green: A Taxonomy of 401(k) Portfolio Choices," Working Paper: <http://www.reish.com/publications/pdf/redyellowgreen.pdf>.

Munnell, Alicia H., Mauricio Soto, Jerilyn Libby, and John Prinzivalli, 2006, "Investment Returns: Defined Benefit vs. 401(K) Plans," Center for Retirement Research, no. 52: http://www.bc.edu/centers/crr/issues/ib_52.pdf.

Xiong, James X., Roger G. Ibbotson, Thomas M. Idzorek, and Peng Chen, 2010, "The Equal Importance of Asset Allocation and Active Management," *Financial Analysts Journal*, vol. 66, no. 2: 22–30.