

1. What is a target maturity (date) fund?

There are two major types of asset allocation funds: target maturity funds (often called *lifecycle* funds) and target risk funds (often referred to as *lifestyle* or balanced funds). Lifecycle funds' asset allocations evolve over time, while lifestyle funds typically have long-term, fixed, strategic asset allocations.

At younger ages (e.g. age 20 to 30) when the capacity for risk and return is usually greatest, the asset allocation mix is invested almost entirely in equity asset classes. As the investor ages and risk capacity declines, the percentage of the fund invested in equity asset classes typically decreases. At or near a typical retirement age, the asset allocation mix is a mix between equity asset classes and fixed income asset classes. Some funds invest a relatively small amount in other asset classes, such as real estate or commodities, to further diversify risk and help fight inflation. Amongst the rapidly increasing number of target maturity funds there are considerable differences in how much the funds allocate to equity asset classes and to fixed income asset classes. In recent years, a number of target maturity fund families have increased the amount allocated to equity asset classes, especially at older ages in order to address the trend of a longer lifespan. Investors need to be aware of the large differences in asset class exposures among the funds – especially the total equity allocation vs. the total fixed income allocation.

The first target maturity fund family was introduced in the mid 1990s. Ibbotson Associates estimated that during 2007 was the first time that the amount invested in target maturity funds surpassed the amount invested in target risk funds. At the end of 2007, there were approximately 38 registered target maturity fund families in the U.S. representing 256 individual target maturity funds with assets under management of \$178 billion.

2. How are target maturity funds different from life style or target risk funds?

Lifestyle funds or target risk funds typically have long-term, fixed, strategic asset allocations. In contrast, the asset allocations of target maturity funds evolve over time. Some investors and advisors create a do-it-yourself target maturity-like portfolio using target risk funds. For example, as an investor ages she may reassess her situation using a risk tolerance questionnaire or other tool, and periodically move into a more conservative target risk fund. Target-maturity funds dial down the risk automatically, but the investor is limited to the strategy and security selections that come with that fund.

3. What type of investor are target date funds appropriate for?

In general, target date funds are appropriate for most investors. However, given the large differences among the different target maturity fund families more time needs to be spent on identifying which target date fund might be most appropriate for a particular investor. Some target date funds are more aggressive; they are more equity-centric than others. Other target date funds are more conservative; they are more fixed income-centric than others.

The two key factors that an investor needs to consider when determining whether an aggressive or conservative target date fund is most appropriate are 1) risk capacity and 2) risk preference. Risk capacity is objective and is derived from the investor's overall economic situation which influences his or

her ability to take on risk. Unlike risk capacity, risk preference is subjective and is the result of an individual's unique personality and perspective.

Target maturity funds are a great choice for a large number of investors, but are not right for everyone. Rather than identify who to encourage, it may be helpful to identify the few who should be discouraged. Target date funds are usually designed for a typical investor assumed to be from a specific country (e.g. the United States), with a typical amount of wealth, and a typical retirement age. The more unique an individual's circumstances are, the more a target date fund becomes a poor fit. Target date funds are less appropriate for investors with large amounts of wealth, large and unique investments outside the target date fund, large defined benefit plans, and/or planning to move abroad. Finally, for those investors who are so unengaged that they will never attempt to determine if they are saving enough, a potential advantage of a managed account over a target maturity fund is a savings rate recommendation.

4. *What is the Equity / Fixed income asset allocation glide path?*

For asset allocation funds, the dominant determinant of the portfolio's risk and return characteristics is the split between equity asset classes and fixed income asset classes. Equity-centric asset allocations are more volatile than fixed income-centric asset allocations. Some investors are willing to take on this additional volatility in hopes that greater risk will lead to greater return over time. The glide path identifies how the split between equity asset classes and fixed income asset classes changes over time.

5. *Why are the equity glide paths of different providers so different?*

There are considerable differences in the equity glide paths from different target maturity families. For a particular age, say age 48 which would more or less correspond to what is commonly called a 2025 fund, the most aggressive target maturity funds allocate more than 95% to equity asset classes while the most conservative target maturity funds allocate less than 65%. In the press, this type of observation is usually painted as a criticism – somebody must be right and somebody must be wrong. Instead, the argument should be framed around which glide path is most appropriate for a particular investor based on the investor's unique circumstances and appetite for risk (risk capacity and risk preference).

To date, there is little evidence of sophisticated rigor behind the design of the equity glide paths. Initial target maturity funds relied heavily on existing target risk funds. Basic heuristics, such as 100 minus the investor's age or perhaps 120 minus the investor's age were followed as target maturity funds started with an aggressive target risk fund-like allocation and moved to a conservative target risk fund-like allocation (a.k.a. the "income" fund model) over an investor's life time.

The traditional categorization and benchmarking methods used for funds with relatively static risk and return characteristics are not well suited for target maturity funds. Category and peer group rankings often focus on return rather than risk-adjusted return. As a result, a number of fund companies have increased the aggressiveness of the equity glide paths in recent years trying to win the peer group ranking battle of a broken system. This increases the disparity in the different glide paths.

6. *What are the investment theories behind the different glide paths? I.e. human capital, shortfall-risk minimization, investment horizon.*

Although the different fund companies would never admit it, Ibbotson suspects most of the equity glide paths are the result of what feels right or something like the 100 minus the investor's age heuristics

rather than robust investment theories. Nevertheless, as assets have flowed into target maturity funds, the rigor behind the development of the next generation of glide paths has also increased. In terms of a workflow process, we believe most glide paths are the result of a top-down workflow that begins with the high-level equity vs. fixed income split. Alternatively, a bottom-up approach could be used in which the detailed asset allocations are decided first and then rolled up to form the high-level glide path.

Human Capital - This approach takes a more holistic view of an individual's total economic worth which consists of two primary components: Financial Capital and Human Capital. Human Capital is the present value of all future labor income. The details can vary, but basically Human Capital is like a giant bond that should provide the individual with relatively stable cash inflows. Relatively speaking, younger investors have little Financial Capital and a large amount of bond-like Human Capital. Due to this overweight in bond-like, untradeable, Human Capital, younger investors need to invest all of their Financial Capital in equities to create a balanced overall portfolio.

Additional Human Capital readings:

- Chen, Peng. (2007). "Is Your Client a Stock or a Bond?" *MorningstarAdvisor*, Spring, 12-14.
<http://advisor.morningstar.com/uploaded/pdf/MAGSAMPLEs.PDF>
- Chen, Peng, Roger G. Ibbotson, Moshe A. Milevsky, and Kevin X. Zhu. (2006). "Human Capital, Asset Allocation, and Life Insurance," *Financial Analysts Journal*, January-February, 97-109.
<http://www.cfapubs.org/doi/pdfplus/10.2469/faj.v62.n1.4061>
- Ibbotson, Roger, G., Moshe A. Milevsky, Peng Chen, and Kevin X. Zhu. (2007). Lifetime Financial Advice: Human Capital, Asset Allocation, and Insurance. Research Foundation of the CFA Institute.
<http://www.cfapubs.org/doi/abs/10.2470/rf.v2007.n1.4580>
- Idzorek, Thomas. (2008). "Lifetime Asset Allocations: Methodologies for Target Maturity Funds." Ibbotson Associate Research Report.
<http://corporate.morningstar.com/ib/asp/detail.aspx?xmlfile=1409.xml>

Liability-Relative Optimization / Surplus Optimization / LDI – This approach also takes a holistic view of the individual's total economic worth by incorporating the individual's liabilities into the problem. Liability-relative optimization techniques are relatively popular with defined benefit pensions and are now being applied to the creation of target maturity funds. Liability-relative optimization recognizes that the reason assets exist in the first place is to pay for a liability – in this case, the investor's retirement income liability. This approach can be used to determine the equity glide path and/or more detailed asset allocation decisions. Liability-relative optimization is a special case (or extension) of traditional mean-variance optimization in which the optimizer is constrained to hold a combination of assets representing the liability short. Liability-relative optimization focuses on the investor's entire portfolio – assets and liabilities – not just the assets of a portfolio. All else equal, liability-relative optimization tends to favor asset classes that hedge the liability. These are typically real return asset classes such as TIPS, real estate, and commodities.

Additional Liability-Relative Optimization / Surplus Optimization readings:

- Idzorek, Thomas. (2008). "Lifetime Asset Allocations: Methodologies for Target Maturity Funds." Ibbotson Associate Research Report.
<http://corporate.morningstar.com/ib/asp/detail.aspx?xmlfile=1409.xml>

- Ruth, Seth. (2007). "Creating the Next Generation Glidepaths for Defined Contribution Plans." Pimco. <http://www.pimco.com/LeftNav/Viewpoints/2007/Glidepath+Paper-+8-2007.htm>
- Chang, Cleo. (2007) "The Evolution of Target Maturity Portfolios: A Liability-Aware Approach to Investing." Wilshire Associates. http://www.wilshire.com/BusinessUnits/Asset/The_Evolution_of_Target_Maturity_Portfolios-A_Liability-Aware_Approach_to_Investing_for_Retirement.pdf

Simulation-Based Optimization – This approach uses Monte Carlo simulation to determine the glide path. Assumptions are made about a particular investor (e.g. salary, savings rate schedule, retirement age) and the performance of the capital markets. The results of the simulation are analyzed based on a measure of "goodness" and the "best" glide path is determined. At this point there is not a consensus regarding how to measure what is good and what is bad and the results are quite sensitive to have this is defined. The results are also sensitive to the capital market assumptions. Nevertheless, this is an exciting framework.

Additional Simulation-Based Optimization reading(s):

- Gardner, Grant W., and Yuan-An Fan. (2006). "Russell's Approach to Target-Date Funds: Building a Simple and Powerful Solution to Retirement Saving."

7. *Within the equity and fixed portions of the glide path, how should the detailed asset allocations be determined?*

Very little research has been done on how the equity and fixed portions of the glide path should be determined. To determine detailed intra-stock and intra-bond asset allocations, first-generation glide paths borrow heavily from their target-risk fund cousins. Many of these strategies set their detailed asset mix by using mean-variance optimization to maximize return after determining an appropriate level of risk. The most promising framework for determining the detailed intra-stock and intra-bond asset allocations is liability-relative optimization or surplus optimization as it is often called. For details see the "Liability-Relative Optimization / Surplus Optimization" section from the previous answer.

8. *How should an advisor, plan sponsor, or individual select from among the many different funds? I.e., What are the key factors in evaluating and selecting a target date fund?*

This is an area of great confusion for advisors, plan sponsors, and individuals. The focus has been on trying to determine which glide path is right and which funds are best as if there were universal truths that answer these questions. Fund must be evaluated on a variety of metrics: expenses, quality of underlying investments, high-level glide path, intra-stock and intra-bond allocations, ability to protect against inflation, and downside protection. This discussion needs to evolve to include a discussion around the key factors for determining which funds are appropriate for which type of investors. Over time, the primary driver of the risk and return characteristics will be the high-level glide path.

Some glide paths are aggressive while others are conservative. The two key dimensions that an investor needs to consider when determining whether an aggressive or conservative target date fund is most appropriate are risk preference and risk capacity. Risk capacity is objective: it is derived from the investor's overall economic situation which influences his or her ability to take on risk. Individuals with defined pensions and "overfunded" retirements have higher risk capacity, but that doesn't mean they like

risk. Unlike risk capacity, risk preference is subjective. Risk preference is the result of an individual's unique personality and perspective.

9. *With more sponsors using Target-Date Funds as their default option, I know they are important, but how do I benchmark them? The funds seem to be all over the map and I am looking for a way to illustrate the differences between them.*

The benchmarking of Target-Date Funds is an extremely difficult, but an important challenge. In the near future we expect to see innovative target-date benchmark families that will help advisors evaluate the performance of the increasing number of target-date funds.

As the question points out, funds are all over the map on a variety of issues: the high level split between stocks vs. bonds, the detailed intra-stock and intra-bond allocations, the use of managers (fund of funds) vs. individual securities, whether to use passive or active managers, the use of a tactical asset allocation overlay, etc. These issues present several benchmarking and performance measurement obstacles.

The ever-increasing need for accountability for this repository of retirement savings however demands that the industry provide a solution. Part of the solution requires greater transparency from fund providers and advances from benchmark manufacturers. Greater effort on the part of financial advisors will be required as well.

The biggest driver of return differences among funds is the evolving stock vs. bond split. In general, a target-date fund invests a majority of its assets in stocks early on. The fund generally shifts the assets out of stocks and into bonds as the investor ages. Some funds follow an aggressive stock mix or "glide path" while others follow a more conservative glide path. The key is to evaluate a given target maturity fund against a benchmark with a similar stock vs. bond split, or risk profile. This approach requires a family of target-date benchmarks.

The appropriateness of aggressive versus conservative is another issue altogether; it depends on both the preference and capacity of an individual investor to take on risk. Thus, an aggressive glide path is not necessarily better than a conservative glide path, and vice versa. Advisors can play a key role in ensuring investors and funds are matched appropriately.

There are several analytic tools advisors can use to illustrate the differences between target maturity funds.

1. Monte Carlo Simulation (MCS) – MCS is a powerful tool for illustrating how funds with different glide paths and different intra-stock / intra bond asset allocations should perform in the future. The current difficulty is finding a MCS tool that allows the advisor to input an evolving detailed asset allocation schedule.
2. Glide Path Comparisons – Glide path charts illustrate the evolving stock vs. bond split of different funds. Glide path comparisons enable advisors to quickly evaluate how aggressive a glide path is relative to other glide paths.
3. Detailed Asset Allocation Comparisons – Detailed asset allocation comparisons illustrate how strategic features like large cap vs. small cap exposure, growth stocks vs. value stocks exposure, domestic vs. international, and nominal bonds vs. inflation-linked bonds differ across a universe of funds with the same target date. These comparisons can be made using

software tools with holdings data. We expect to see in the near future widely available reports that monitor the detailed asset allocations of the target-maturity universe.

4. Risk and Return Graphs – A simple tool that all advisors can use today to compare funds and to gain insights into the underlying asset allocations is a simple risk and return graph. I recommend plotting the performance of target maturity funds with the performance of individual asset classes over a variety of time periods.

The good news is there are also several qualitative features in each fund that are very helpful to understand. An advisor can help gather this information and guide an investor through the choices. Some objective areas to explore include:

1. Asset allocation strategy – what’s the theory behind the mix? Is there a style bias? Is any tactical asset allocation expected?
2. Inflation risk – what is the fund’s strategy to fight inflation? When will inflation-fighting asset classes be deployed?
3. Longevity – how does the fund plan to mitigate this risk, i.e. what is the fund’s position on annuities? If annuities are an option, is there a recommended percentage, by a recommended age?
4. Goal targeting ability – investors should understand the goal of the fund. Example goals include: maximum lump sum at maturity date, adequate income stream to maintain lifestyle for a set number of years, or minimum income needed to cover essential expenses as long as possible.
5. Expense efficiency – what are the fund of fund/structural fees? How are distributions and rebalancing handled?
6. Quality of investment choices – what are the average ratings of the securities in the fund? Must the investor use what’s available from one fund family? Is the target-date fund a multi-manager fund that uses the best fund available for each asset class, no matter who provides the fund? Are there too many funds in the fund? The count can range from half a dozen to over 40; we think 15-20 is a reasonable zone.

10. How will PPA impact target maturity funds?

The Pension Protection Act of 2006 should increase the popularity of three of the QDIA options – target risk funds, managed accounts, and target maturity funds. The current consensus is that of these three, target maturity funds will be the biggest winner. We estimated that during 2007 the amount invested in target maturity funds surpassed the amount invested in target risk funds for the first time. At the end of 2007, there were approximately 38 registered target maturity fund families in the U.S. representing 256 individual target maturity funds with asset under management of \$178 billion.

It may also slightly change the allocations of the 100% equity funds. The rules state that the QDIA participant’s portfolio is to provide “varying degrees of long-term appreciation and capital preservation through a mix of equity and fixed income exposures” based on the participant’s age, target retirement date or life expectancy. There is some ambiguity around the “mix of equity and fixed income exposure” and as a result some 100% equity solutions (arguably for younger investors) may be changed to include a small, but distinct allocation to fixed income.