Why Target Date Fund Glide Paths Should Land Safely, but Don't

1. Academic simulations prove that the distribution of wealth is greater with glide paths that increase in equity allocation rather than decrease. No safe landing.
2. Savings impact the distribution of wealth much more than glide path direction, up or down. Savings matter most.
3. "Save and Protect" is the formula for retiring with dignity. Savings need to be very safe in the Risk Zone when Sequence of Return Risk peaks.
4. Market crashes happen. That's when everyone cries for protection, after the damage is done. Win by not losing.

Target Date Funds (TDFs) leapt onto the 401(k) scene in 2007 following their designation in the Pension Protection Act of 2016 as a Qualified Default Investment Alternative (QDIA), but academics argue that TDF glide paths are seriously flawed and should be changed. TDF investments currently exceed $1.5 trillion and are growing rapidly.

There are two series of academic research regarding TDF glide paths. One series examines the "Accumulation" phase that spans a participant's working life from date of hire to retirement. The second series analyzes the "Decumulation" phase that spans retirement years. All of these studies find serious flaws in current glide paths. We discuss a few representative studies from both series in the following.

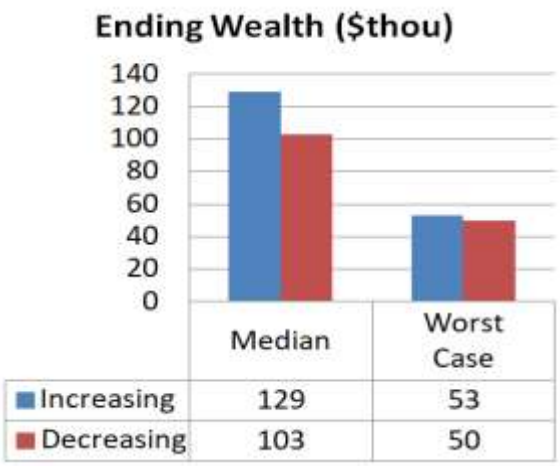
Accumulation Glide Paths

Separate studies by Arnott and Drew and Basu conclude that TDF glide paths should increase in equity exposure rather than decrease. These academics use glide path simulations to show the statistical dominance of wealth distributions for an increasing glide path. The expected ending wealth is higher AND the worst case ending wealth is greater than the worst case for the standard decreasing glide path. The following table is from the Arnott article:

EXHIBIT 10

A Comparison of Retirement Strategies, 1927–2011

	A Inverse Glidepath 20→80	B Glidepath 80→20
Panel A: Ending Retirement Assets		
Average	$126,400	$116,440
Std Dev	$50,240	$45,090
Min	$53,040	$49,940
10%ile	$63,410	$64,950
50%ile	$128,800	$102,920
90%ile	$185,870	$177,340
Max	$238,660	$211,330



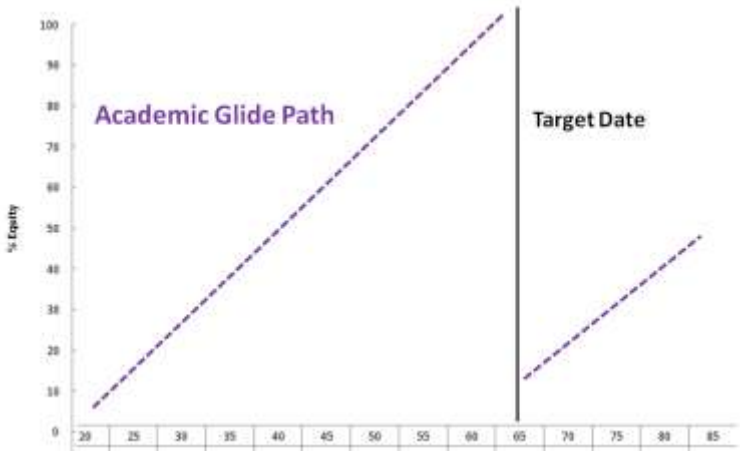
Note that the "Increasing" wealth distribution is statistically dominant: the entire distribution is greater than the "Decreasing" distribution. No surprise, risk is rewarded if you get thousands of tries. Note also that the advantage is not really that much. The median cumulative annualized return for the Increasing glide path is 5%, versus 4% for the Decreasing path. One view is that the cost of safety (opportunity drag) is 1% per year. In a section that follows below we show that savings matter a lot more than glide path.

Decumulation Glide Paths

Kitces and Pfau (K&P) and Fullmer examine post-retirement glide paths. K&P simulate a whole range of potential glide paths while Fullmer uses advanced statistics and logic. Both researchers conclude that the best glide path in retirement starts with a very low equity allocation and increases through time. K&P conclude ***The most favorable (i.e., least adverse) shortfall actually occurs with a glidepath that starts at only 10% in equities and rises to "only" 50% in equities.***

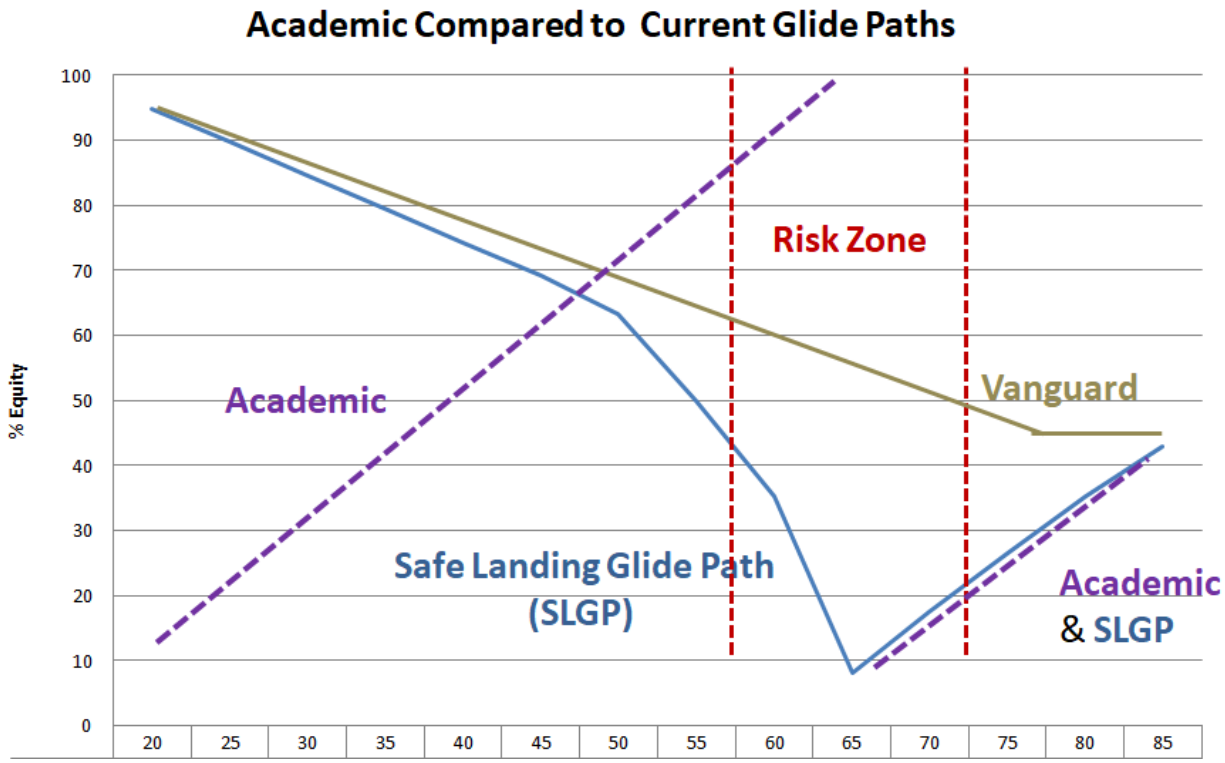
Summary

A glide path following these recommendations looks like the graph on the right:



Equity allocations increase to 100% at the target date, and then 90% of these equities are sold, followed by re-risking up to 50% equities.

No current glide path looks like the academic Accumulation path, but one current glide path does follow the recommended Decumulation path, as shown in the following:



What's wrong?

There's an important and fundamental distinction between the Accumulation and Decumulation studies. The Accumulation studies focus exclusively on building wealth while the Decumulation studies focus on preserving wealth. We believe the Decumulation studies have the correct focus, but the Accumulation studies do not because they ignore the human aspects of accumulating wealth. Importantly, simulations get to "live" thousands of lives but we each get only one chance, and our human instincts are to make it a safe chance.

The actual glide paths in the above are Vanguard because it is the industry standard and the lesser known patented Safe Landing Glide Path (SLGP). As you can see, these glide paths differ dramatically in the Risk Zone and beyond. We'll discuss the Risk Zone in more detail in the following, but these differences arise from different objectives. The Vanguard path is riskier in the Risk Zone and beyond because participants don't save enough, so the hope is they can make up some of this inadequacy as they near retirement by earning more on their investments. Account balances are their highest in the Risk Zone. The Vanguard emphasis is on building wealth rather than preserving wealth.

By contrast the objective of the SLGP is wealth preservation in the Risk Zone – the same objective optimized in academic Decumulation studies. The SLGP view is that it is a Bad Gamble to risk your lifetime of savings as you near retirement. This is the human aspect discussed in the next section – you only get to pass through the Risk Zone once.

The Human Face of Target Date Fund Glidepaths

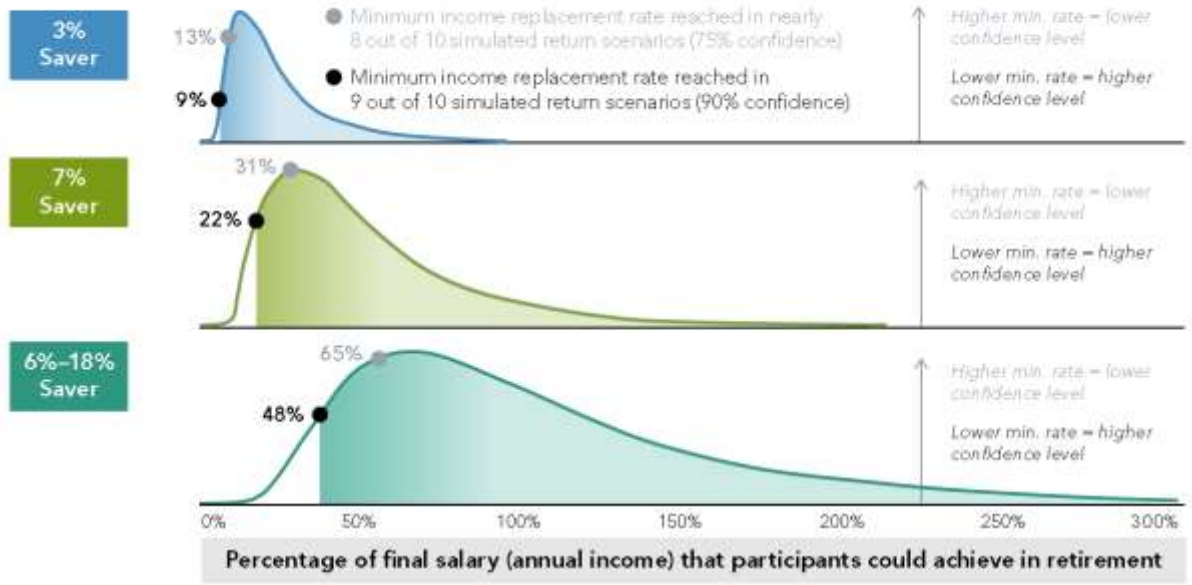
Here's the economic, behavioral and emotional reality of glidepaths. We each have only one life path, not the thousands that a computer can simulate. And we each prepare differently for retirement. The most important aspect of our preparedness is savings. Some of us will save "enough" and some of us won't. Those who haven't saved enough will redefine "enough" – they'll reduce their standard of living. Regardless of our savings history, we all develop a plan as retirement approaches. Some of us see yachts in retirement while others see trailer parks. Either way, a plan is a plan. Disruptions to our planned lifestyle take a huge toll, and can lead to deep depression and physical calamities, like drug and alcohol abuse. It is not worth the risk to try to make up for inadequate savings by taking it to Las Vegas.

Savings matter much more than glide paths as shown in this Fidelity report:

Five Key Factors to Help Improve Retirement Outcomes for Target Date Fund Investors

EXHIBIT 3: Although a range of outcomes can be expected for any target date fund investor (shaded area), plan participants who saved consistently at a higher rate were more likely to experience higher income and a wider range of potential outcomes.

Higher Savings Rates Can Lead to Higher Retirement Income



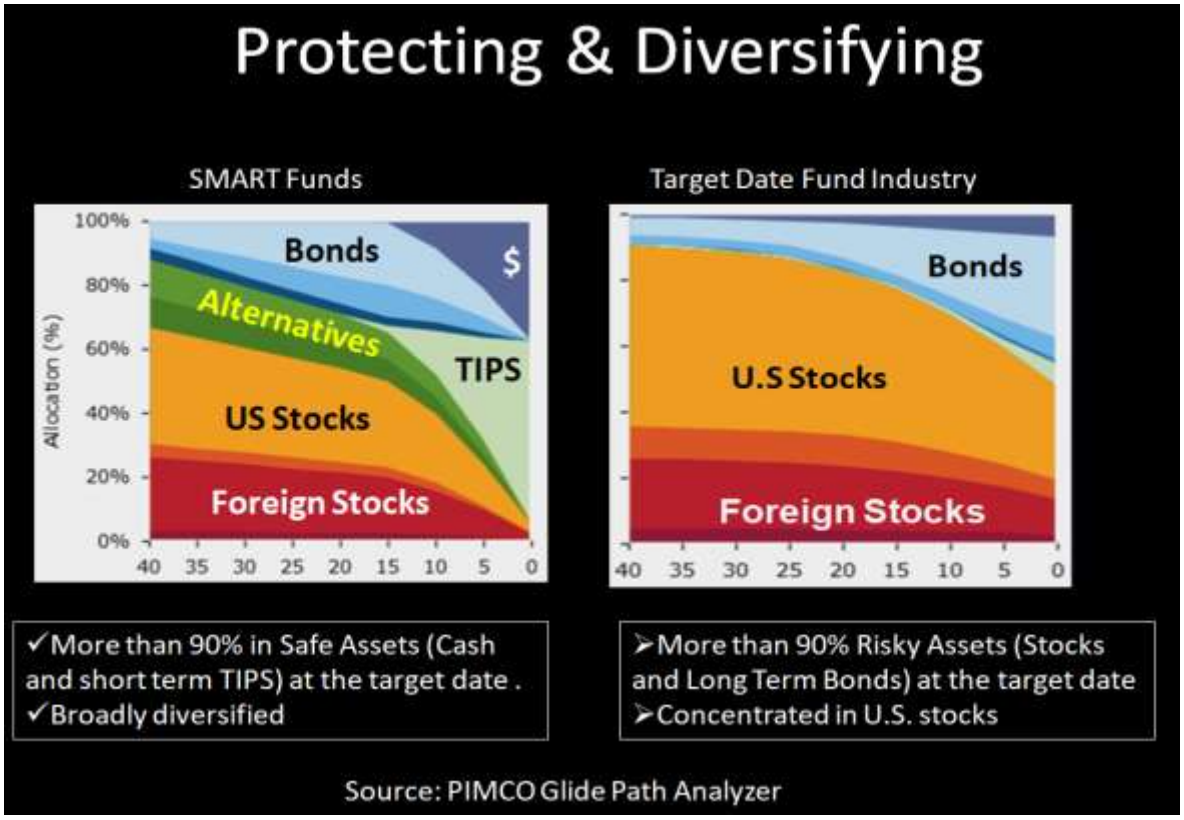
The distribution curve is illustrative of the range of attainable income replacement rates (x-axis) and the frequency of attaining a given income replacement rate (y-axis) for a hypothetical investor. The distribution is illustrative of approximately 100,000 randomly generated scenarios. The distribution is derived using stochastic, or randomly generated, simulations and is based on the following assumptions: Starting age, 25; Retirement age, 65; Retirement planning age, 93. The lifetime strategic asset allocation for the analysis is based on Fidelity's strategic glide path. The asset classes include U.S. equities, non-U.S. equities, U.S. investment-grade bonds, and short-term debt. The stated income replacement rate represents the minimum real income replacement rate of a hypothetical investor's experience, with 90% confidence, based on a final pre-retirement salary. For example, in 90% of the simulated scenarios, the "6%–18% saver" would realize a real income replacement rate of 48% or greater. The assumptions for three savings scenarios are: "3% Saver:" 3% constant savings from age 25 through 64 (no employer match, no increase); "7% Saver:" 7% constant savings from age 25 through 64 (no employer match, no increase); "6%–18% Saver:" 6% savings rate beginning at age 25, increasing 1% each year until 18%, 18% thereafter through age 64 (no employer match). The results do not include the impact of taxes and fees. All Saver scenarios reflect an annual inflation-adjusted salary growth rate of 1.5%. IMPORTANT: The projections regarding the likelihood of various outcomes are hypothetical in nature, do not reflect actual investment results, and are in no way guarantees of future results. Please see appendix for additional information regarding stochastic simulations and indexes used. Source: Fidelity Investments.

Accordingly, the path to retiring with dignity is to save and protect. The big question in TDF design is when to protect and by how much.

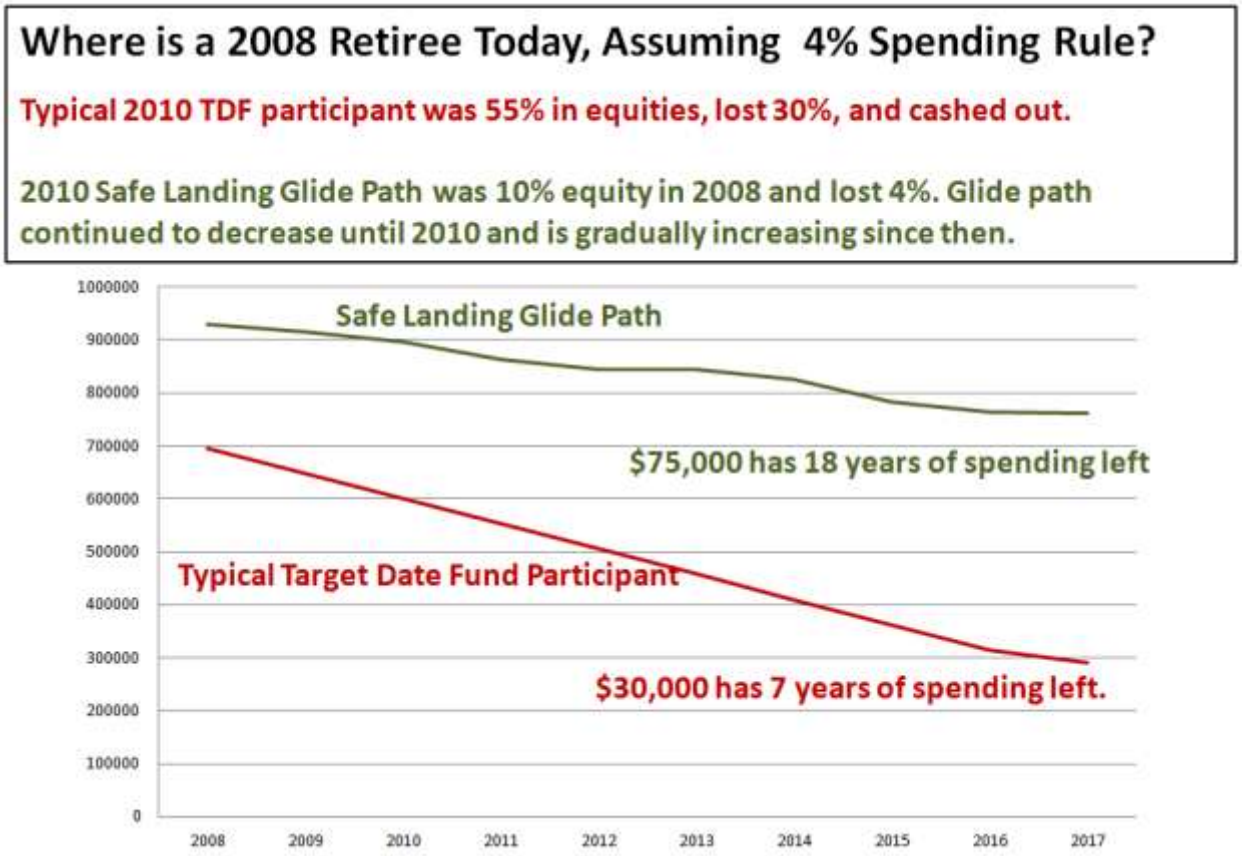
That's the human side of glidepaths – safety at retirement makes a big difference.

Lessons from 2008

Most of us have forgotten the devastation of 2008 when the typical IRA and TDF lost 30%. Although it went unnoticed, one TDF defended quite well in 2008, with only a single digit loss. The following graph compares the SMART TDF to the industry.



In the 9 years since 2008 U.S. stocks have soared, earning more than 250%, so the belief is that TDF participants have been made whole and then some, but that's simply not true because most participants in TDFs withdraw their accounts when they retire and it's reasonable to assume that, having been burned, they put their savings in the bank. As shown in the following graph, these typical participants have about 7 years of spending left in their TDF balance, assuming they are using the standard 4% withdrawal rule. By contrast, if they were protected by the SMART TDF that uses the patented Safe Landing Glide Path®, they have about 18 years of spending left today.



The public outcry in 2008 was just a whimper compared to what can happen when $30 trillion in Boomer assets gets slammed. Can Society support tens of millions of Broke Boomers? Will it? **We all lose if Boomers lose**. The exposure to loss is NOT different this time, but its consequences are.

Forgetting 2008 exposes us to a repeat and to potential lawsuits as ERISA attorney Nancy Ross states in **ERISA Litigation Landmarks Set the Stage for 2018** : *"But as the stock market inevitably weakens, you see claims about the failure to offer diversified and defensive lineup. So it's tough to give employers general guidance about how to protect themselves."*

2008 is just one of many market crashes. The following table shows how the Vanguard glide path would have fared in various crashes, compared to the Safe Landing Glide Path (SLGP).

How much will 2020 TDFs lose if a market crash repeats?

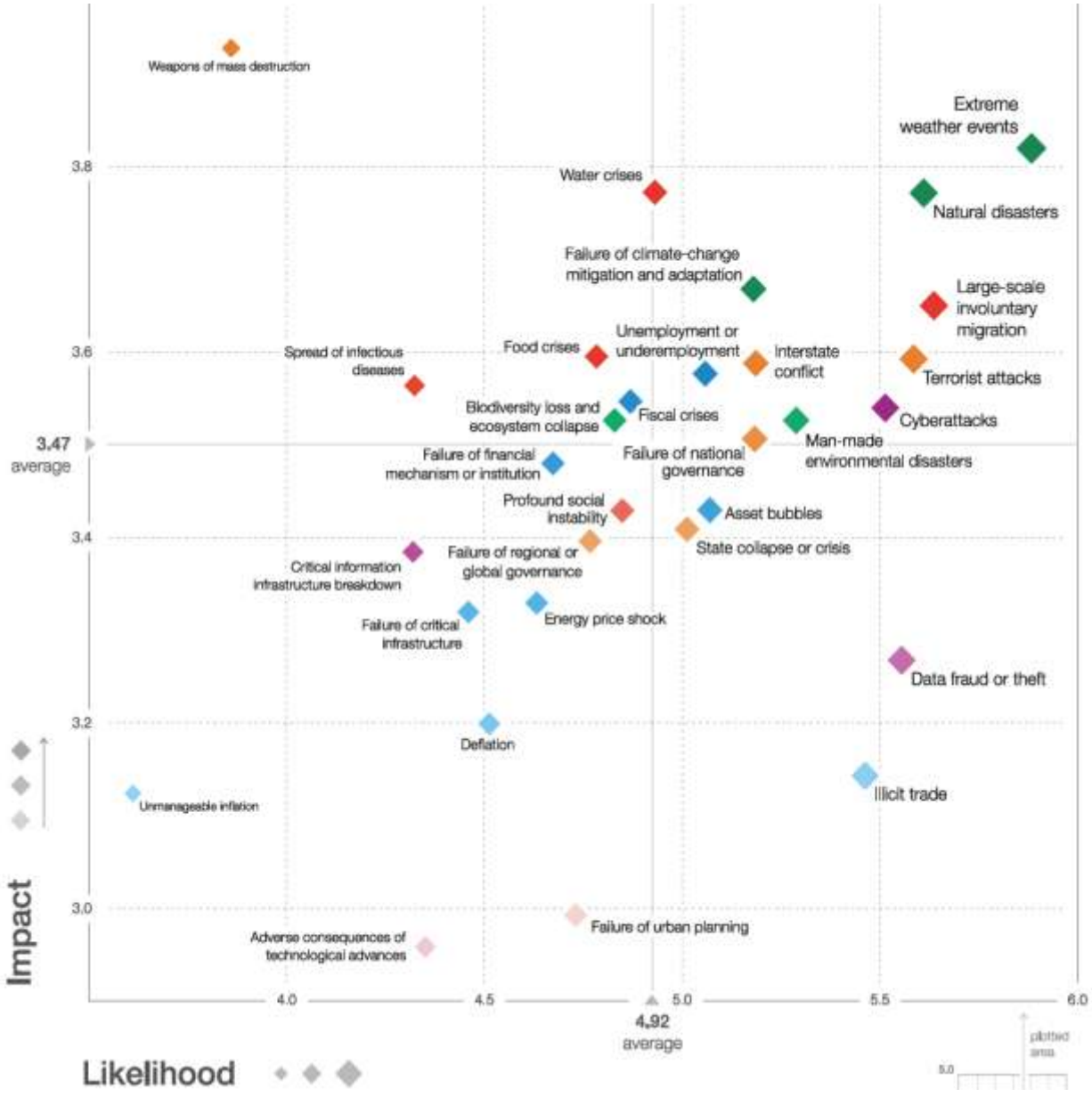
Time period	Length (months)	Loss	Vanguard TDF loss	SLGP TDF loss
9/29-6/32	34	86	50	16
12/61-6/62	6	28	16	2
11/68-5/70	18	36	20	3
1/73-10/74	21	48	28	9
11/80-8/82	21	28	16	2
8/87-12/87	3	34	19	3
3/00-10/02	32	78	46	15
10/07-3/09	17	56	32	10

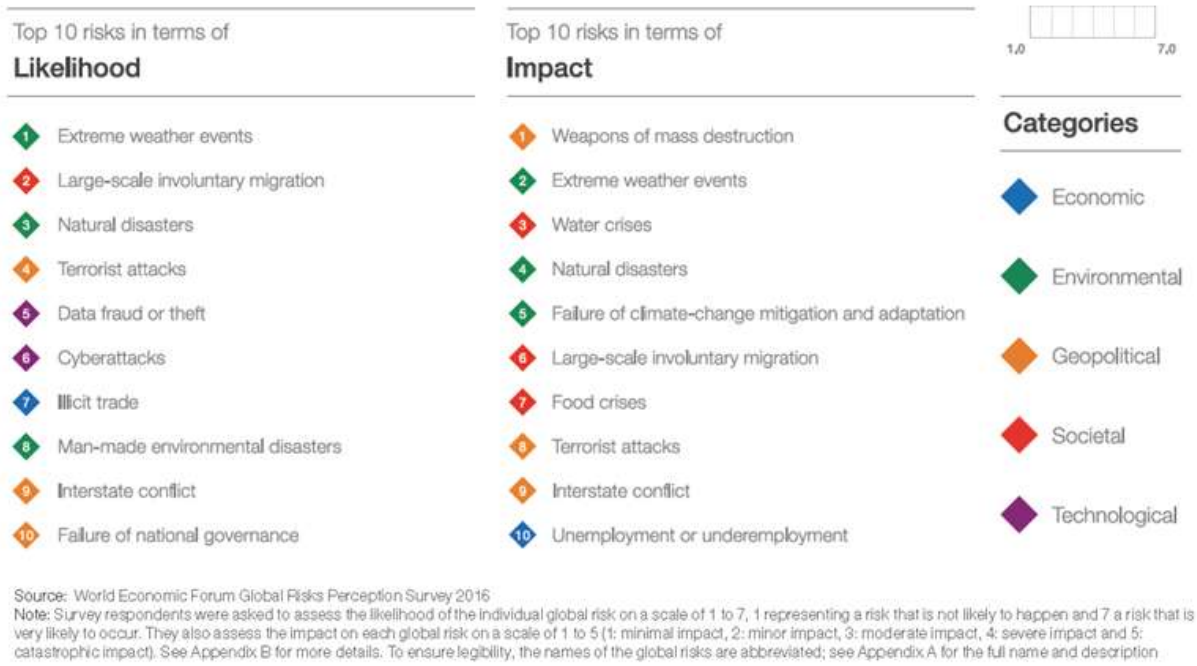
The Risk Zone

Academics tell us that that we are most at risk as we transition from working life to retirement. Professor Moshe Milevski has popularized the term Risk Zone because our accounts are their highest and Sequence of Return Risk can devastate lifestyles. The following exemplifies Sequence of Return Risk

Retirees cannot recover from investment losses the way they could while working. Their only course of action is to lower their standard of living, which takes an emotional and physical toll, as well as burdens our society which thankfully cares for its elderly.

Current threats to the U.S. stock market exacerbate Sequence of Return Risk. The following graph from the World Economic Forum pinpoints 30 sources of potential future shocks, along with their magnitudes and likelihoods. For example, "Extreme weather events" has a high Likelihood because hurricanes and firestorms have already decimated several U.S. cities and territories, and the Impact is high because the costs of recovery are enormous. Too many investors are ignoring these risks, for now. Some can afford to be complacent, but those in the Risk Zone cannot.





Source: World Economic Forum Global Risks Perception Survey 2016
Note: Survey respondents were asked to assess the likelihood of the individual global risk on a scale of 1 to 7, 1 representing a risk that is not likely to happen and 7 a risk that is very likely to occur. They also assess the impact on each global risk on a scale of 1 to 5 (1: minimal impact, 2: minor impact, 3: moderate impact, 4: severe impact and 5: catastrophic impact). See Appendix B for more details. To ensure legibility, the names of the global risks are abbreviated; see Appendix A for the full name and description.

So how safe is safe? Zero equities and zero long term bonds is safe. The common practice is to increase bond exposure as the target date nears, but long term bonds are not safe in this economic environment. The right "Safe" is entirely short term Treasury bills and Treasury Inflation-Protected Securities (TIPS). Note that this safety need not apply to retirement years. Rather it's critical to the transition from working life to retirement. Choices in retirement can and should be unique and individualized.

Win by not losing

The arithmetic of financial losses is complex and emotional, so an example will help. In 2008 the 2010 SMART Target Date Fund Index lost 5% while the industry lost 25%. As a result, SMART investors were wealthier than other TDF investors for the next 6 years, when the riskier Industry funds caught up. But – and this is the important point – when the next crash happens, the whole scenario will reset, and SMART will shine again.

Investors win by not losing. It's a safer course.

Conclusion

All target date fund glide paths move from an emphasis on building wealth to keeping wealth as retirement nears, but only one glide path is serious about preservation in the Risk Zone. **Only one TDF glide path lands safely**.

One way to recognize the appropriate level of risk near retirement is to consider academic studies on retirement glide paths that preserve wealth. The recommended glide path starts at 10% in equities on the retirement date, which means that ending allocation in the accumulation phase should be 10%. Preservation doesn't begin on the day we retire. It begins 5 to 10 years before that day.

The two key decisions that a target date glide fund path designer must make are (1) when to start applying the brakes, and (2) how forcefully.

1. **Apply the Brakes**. Glide paths should begin to protect when the horizon is short enough to experience a risk of loss. It is highly unlikely that an investor in a well diversified portfolio of risky assets will experience a loss over a 15 year period. Accordingly, this risk-of-loss rule argues that the brakes are first applied at 15 years to target date.

2. **How forcefully**. The magnitude of transfer from risky to protective asset can be determined using the principles of liability-driven investing (LDI). Sufficient assets are set aside in a protective asset such that, even if the worst case, risky return is realized over the horizon the total account balance is insulated from loss. This structure leads to a non-linear glide

path because transfers increase exponentially. Here's an example. Let's say we're 15 years from target date and our estimate of the worst case unannualized return on risky assets is -5%. And let's also say that TIPs are priced to earn a 2.5% return per year so over 15 years this would compound to more than a 45% return. To protect against loss we want -5(1-X) + 45X = 0, where "X" is the amount invested in the protective asset. In this case you can verify that X is 10%, so we move 10% of assets out of risky and into protective. As the time to target date shortens the worst case risky asset loss increases and the cumulative return on the protective asset decreases, so the amount in the protective asset increases at an increasing rate, ultimately reaching 100% at target date.

So far the competition for target date business has been won by brand and performance, and has led most to favor a very gentle application of the brakes, leaving the target date fund in a substantial risky asset allocation at target date, holding around 55% equity with most of the balance in risky long term bonds -- riskier than 2008 when they lost b30%. Most target date fund glide paths do not land safely. This is dangerous and imprudent, and most importantly it is not in the best interests of the beneficiary.

DoL prudence standards could change current fiduciary preferences. Prudence argues for rigorous risk management, broad diversification, and low fees. Please check out the prudence scores of the brand names. The price of prudence has been about 1% per year over the past decade, but there will be a reward for prudence in the next market crash. Prudence comes at a reasonable cost. Fiduciaries need to take their Duty of Care seriously.

A personal endnote

My first job was with Northrop, where I designed equipment to jam heat seeking missiles so they couldn't obliterate our aircraft. In those days our equipment was "passive," meaning it was always on. We were told that some pilots turned our jammer off because it degraded aircraft performance.

Target date fund glide paths that land safely are like jammers protecting against market crashes. In the parlance of investment management, effective jamming equipment is "Risk Management" and pilots (investors) who turn it off are "Market Timing."

TDF glide paths that do not land safely are terribly ineffective jammers; obliteration will occur when the next market crash happens.