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Retirement risk metrics for evaluating target date funds: a scenario modelling framework

For investors, advisors or corporate plan sponsors, the choice of an appropriate target date investment fund is a daunting task. In particular, there is an absence of quality information describing the risk characteristics of the various Target Date funds, which would allow the investor, advisor or plan sponsor to answer questions such as:

- Am I comfortable with the amount of risk in the fund?
- Which product allows me to meet my retirement planning objectives?
- How does the risk profile of my fund compare with others in the peer group?

Despite strong technical and practical motivations for using Target Date funds as default investments within 401(k) and IRA plans, the lack of objective information to evaluate the risk profile of these products was brought into focus by the experience of 2008. The ERISA Advisory Council had already called on providers of Target Date products to provide material to enhance awareness of the value and the risks associated with these investments. The DoL and SEC joint hearing of June 2009 focused on the level of information available to investors and plan fiduciaries about the character and risk of target date funds.

Barrie & Hibbert have developed a series of Retirement Risk Metrics, which can be used by investors, advisors and fiduciaries as a 'dashboard' for evaluating risk and value across a variety of Target Date products. This report provides an outline example of these metrics, applied to the asset allocation glide-paths associated with existing US Target Date funds.

These Retirement Risk Metrics, when used in conjunction with other information such as fund prospectuses and historic performance data, will facilitate a clearer understanding of the risks in Target Date investment products and enable more informed product selection decisions.

Target date funds - background

The first target date or lifecycle funds were marketed in the early 1990s, aimed at the growing defined contribution pensions sector. As with many new innovations, initial take up was slow, with total assets reaching around \$10bn by the end of the decade. However, since then, the increased

scale of the defined contribution savings market, combined with the enactment of the US Pension Protection Act 2006, has dramatically increased the opportunity for Target Date funds:

- + It removed fiduciary impediments to automatic enrolment of employees into defined contribution plans such as 401(k), by exempting advisors and plan sponsors from liability for market-related fluctuations in funds with "qualified default investment alternative" (QDIA)¹ status
- + In October 2007, the US Department of Labor selected target date or lifecycle funds in the final list of product types to be assigned QDIA safe harbor status.

The result has been a dramatic acceleration of asset inflows into target date funds. By July 2009, the largest fund series alone boasted assets over \$85bn². Furthermore, asset inflows to target date funds have been relatively unaffected by recent capital market turmoil, and have continued to grow rapidly year-on-year.

The QDIA qualification criteria define target date funds in generic terms, as products with a mix of investments that take into account the individual's age or retirement date. This permits fund providers to exercise significant discretion in constructing the asset allocation glide-path underlying their target date series. Exhibit 1 compares the broad equity allocation glide-paths associated with a number of US Target Date Fund Series, based on published information.

Exhibit 1

Asset Allocation Glide-paths for Representative US Target Date Funds (end-November 2009)

Fund	Equity + Real Estate Allocation (% by Investment Year/Age, T = Target Date)								
	T-15 Years	T-10 Years	T-5 Years	T	T+5 Years	T+10 Years	T+15 Years	T+20 Years	T+25 Years
Alliance Bernstein	86%	79%	72%	65%	55%	45%	35%	35%	35%
John Hancock	88%	79%	68%	56%	50%	50%	50%	50%	50%
Mainstay	80%	63%	60%	55%	45%	40%	40%	40%	40%
Principle	74%	67%	64%	54%	44%	35%	25%	25%	25%
BlackRock	71%	62%	56%	52%	50%	50%	50%	50%	50%
TIAA-CREFF	76%	68%	60%	52%	46%	40%	40%	40%	40%
Fidelity Advisor Freedom	70%	65%	53%	51%	35%	20%	20%	20%	20%
T Rowe	76%	69%	60%	50%	48%	47%	45%	43%	42%
Nationwide	76%	67%	57%	49%	44%	40%	35%	30%	30%
Fidelity Freedom	75%	65%	53%	45%	30%	20%	20%	20%	20%
Goldman Sachs	72%	66%	58%	45%	40%	40%	40%	40%	40%
Vanguard	71%	63%	54%	42%	30%	30%	30%	30%	30%
JP Morgan	73%	64%	54%	40%	33%	33%	33%	33%	33%
Wells Fargo	61%	47%	35%	24%	19%	14%	14%	14%	14%
Equity Allocation Range	27%	32%	37%	41%	36%	36%	36%	36%	36%

Sources: target date fund provider websites and prospectuses, Morningstar

Target Date Asset Allocation Glide-Paths:

For the purposes of illustration in this report, we have estimated asset allocation glide-paths based on information provided in the prospectuses of a number of US Target Date funds at end-November 2009. These prospectuses were downloaded from the fund providers' own websites, or where no such prospectus was available, from the Morningstar.com website. In using this past information on actual target date series, our objective is to illustrate the nature of the differences between the glide-paths in general terms, rather than to analyse the position of particular funds at a specific point in time.

Furthermore, there is some variation between the different series with regard to the detailed application of target dated funds for investors with different retirement target dates. For example, the 2010 fund series may be applicable to investors retiring over some period which may include 2010 but may extend into other years. In general, unless stated explicitly in the prospectus, we have assumed that the asset allocations associated with the various 2010 funds reflect the asset allocation at the target retirement date. Note that the analysis in this report constitutes Barrie & Hibbert's reasonable opinion, based on publicly available information, and is not intended as a statement of fact.

¹ 29 CFR Part 2550; RIN 1210-AB10; Default Investment Alternatives under Participant Directed Individual Account Plans, Federal Register / Vol. 73, No. 84 / Wednesday, April 30, 2008.

² Morningstar, Inc. Target date Series Research Paper: 2009 Industry Survey. September 9, 2009.

Although there are significant differences in equity exposures across the entire glide-path, the variation is most stark for investors close to their target retirement date (T). These differences can be accounted for by a number of factors which are taken into account in the glide-path construction process:

- + **Market risk vs. Longevity risk.** Different fund series providers adopt contrasting views as to which of these risks is of greatest importance. The approach taken has a significant impact on the glide-path – particularly on the equity allocation close to the target date (T)
- + **"Target To" vs. "Target Through":** In simple terms, some glide-paths are designed to 'stop' at the target date, at which point the investor may re-assess their retirement planning options. Others are designed to continue seamlessly into and through the income phase of the retirement lifecycle.
- + **Investor risk profile:** For most investors, the objective is to generate returns which are higher than could be achieved by investing in 'risk-free' Treasury securities such as TIPS. Different providers have adopted different positions regarding where their fund should sit on this risk/return spectrum, based on what they believe is most appropriate for, or most attractive to, the DC investor market.

This variation in equity allocation creates the potential for very significant dispersion in performance of the different fund series, as was evident during the period of market turmoil in 2008. Although this experience caused significant consternation for many target date investors, particularly for those close to their specified target date, we believe this was a function of the absence of quality information describing the risk characteristics of the various Target Date funds.

This view is broadly reflected by the behaviour of various bodies responsible for regulating the market. The ERISA Advisory Council had already called on providers of Target Date products to provide material to enhance awareness of the value and the risks associated with these investments. The DoL and SEC joint hearing of June 2009 focused on the level of information available to investors and plan fiduciaries about the character and risk of their funds.

Whatever factors account for the variation in asset allocations across the different fund series, **it is clear that these variations in asset allocation lead to very different levels of risk for investors in target date products.**

Conventional risk measures do not work for target date funds

One of the reasons for the lack of such information is that conventional approaches to measuring risk do not work for target date funds. Traditional investment risk measures use time-weighted measures of portfolio risk such as volatility over specified investment periods – one year, five years, ten years. These measures of risk may help where a single cash flow is invested in a fund with a static asset allocation, but neither of these constraints holds in the case of a target date fund:

- + The asset allocation underlying the target date fund changes throughout the investment term and so it is not possible to take a risk statistic such as volatility calculated over one year, say, and apply a time-weighting to extrapolate the same risk metric out over ten years.
- + Since the purpose of a target date fund is to take a stream of cash flows and generate wealth, and since traditional time-weighted risk measures such as volatility ignore the effect and timing of cash flows, these tell us nothing about the ability of a target date fund to meet the retirement investment objective. In particular, a traditional time-weighted risk measure will ignore the fact that poor returns in the final few years before retirement have much greater impact on retirement wealth than poor returns in the early years.

Path-Dependent Risk :

Both of these issues described above mean that the risks in a target date investment are **path-dependent**, i.e. the outcome is dependent on the intermediate path of investment returns at each point in the investment period, rather than simply the time-weighted risk over the entire investment horizon. In order to capture this intermediate path explicitly, we need to use a scenario-based risk model.

A stochastic modelling framework for evaluating target date funds

Barrie & Hibbert have developed a series of scenario-based Retirement Risk Metrics, which can be used by investors, advisors and fiduciaries as a basis for evaluating risk and value across a variety of Target Date products. In this note, we have used a simple illustrative case study to describe this stochastic approach and the resulting Risk Metrics and apply these to a sample of US Target Date funds.

Risk management for retirement investors: a case study

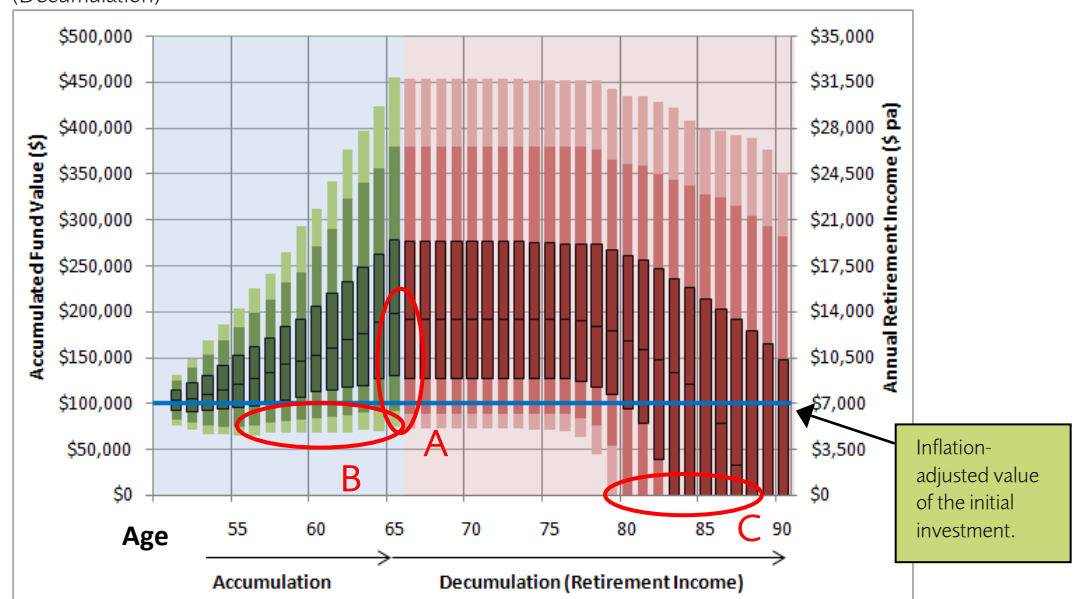
For the purposes of illustration, we will consider the following investor profile:

- + The investor makes a single payment of \$100,000 into their chosen Target Date investment fund at age 50.
- + Accumulation Phase: The investor accumulates savings in their chosen fund until they reach age 65.
- + Decumulation Phase: From age 65, the investor withdraws a fixed \$ income amount each year through retirement. For this case study, we will assume the retirement income level is set to 7% of the fund value at the retirement date. This income is similar to the current market life annuity rates.

We can use our stochastic scenario model (ESG) to simulate investment outcomes for the entire lifecycle of this retirement investment. Exhibit 2 illustrates the results of this simulation for a hypothetical Target Date glide-path, which falls broadly within the range of US Target Date glide-paths described in Exhibit 1.

Exhibit 2

The Retirement Investment Lifecycle: Projected Fund Value (Accumulation) and Retirement Income (Decumulation)



Notes on the interpretation of Exhibit 2:

The shaded bands ('funnel of uncertainty') represent different percentile points of the projected distribution of accumulated fund value (green) and retirement income (red). This projection is based on the scenarios generated by our stochastic model, the Barrie & Hibbert Economic Scenario Generator.

The darker-shaded central band shows the range of outcomes between the upper and lower 25th percentile points of the distribution (also called the inter-quartile range). The intermediate shaded band shows the range between the upper and lower 10th percentile points of the distribution. The lighter shaded bands show the range of outcomes between the upper and lower 5th percentile points. In other words, 5% of outcomes will fall below the bottom end of the lightest shaded part of the bar chart.

For our 50-year old investor entering the target date, these charts highlight some important risks:

- + There is significant uncertainty regarding the value of the investor's savings fund at retirement. This will have a direct impact on the level of income that can be drawn in retirement. See **A** in Exhibit 2.
- + There risk that the investor's fund falls in value through the accumulation phase. See **B** in Exhibit 2
- + There is a risk that the chosen level of income in retirement (the decumulation phase) cannot be sustained and the investor runs out of money before they die. See **C** in Exhibit 2.

Accumulation phase

During the accumulation phase, the retirement investor's objective is simple – to grow the savings fund in real terms in order to generate an income stream during retirement. Whilst, in theory, retirement investors could achieve this by holding inflation-indexed bonds, most will accept a degree of risk in order to achieve higher returns. The question is *how much risk?*

In broad terms, in the accumulation phase, the target date investor will be concerned with two types of risk:

- + Total accumulation risk: this is the uncertainty about the cumulative investment growth on the retirement fund through the entire accumulation phase, and hence the level of the retirement savings fund at the retirement target date.
- + Within-Horizon risk: the risk of (significant) fluctuations in fund value at any point during the accumulation phase, but particularly in the final years before retirement, where the investor's capacity to mitigate losses will be diminished.

Let us first consider again the accumulation phase of the retirement lifecycle simulation shown in Exhibit 2. This is the section of the chart shown by the shaded green bars. The final green bar highlighted within '**A**' in Exhibit 2 illustrates the distribution of fund value at the target retirement date. This highlights the potential scale of the risks facing the retirement investor:

- + There is a 50% chance the real value of the investment fund grows to at least \$200,000 at retirement.
- + There is over a 10% chance the real value of the investment fund falls below \$100,000 at retirement, i.e. the fund loses value, in real terms.
- + There is a 5% chance that the real value of the fund falls below \$75,000 at retirement

Exhibit 2 illustrates the risk and return for the retirement investor based on a hypothetical glide-path assumed in our case study. In Exhibit 3, we use the same case study analysis the risk and return characteristics of the various US Target Date glide-paths described in Exhibit 1. The chart shows the distribution of accumulated fund value at retirement based on \$100,000 invested in the different Target Date glide-paths over a 15 year accumulation phase. These distributions are shown in real terms to allow for the impact of inflation:

Important Note:

In the following analysis, we have modelled asset allocation glide-paths based on the broad asset class exposures of a number of US Target Date funds. We have used publicly available glide-path data from fund prospectuses on the fund providers' websites. Where we have been unable to access a prospectus in this way, we have referred to glide-path data on the Morningstar website. Most importantly, the analysis does not attempt to model the particular holdings or asset structure of any of these funds at a particular date. In particular, we have not attempted to model individual stock positions or credit exposures, or particular tactical asset allocation positions. As such, this analysis is not intended to reflect the actual risk and return characteristics of particular funds.

Exhibit 3:

Distribution of Real Fund Value at Target Retirement Date (Age 65), Based on \$100,000 Payment at Age 50

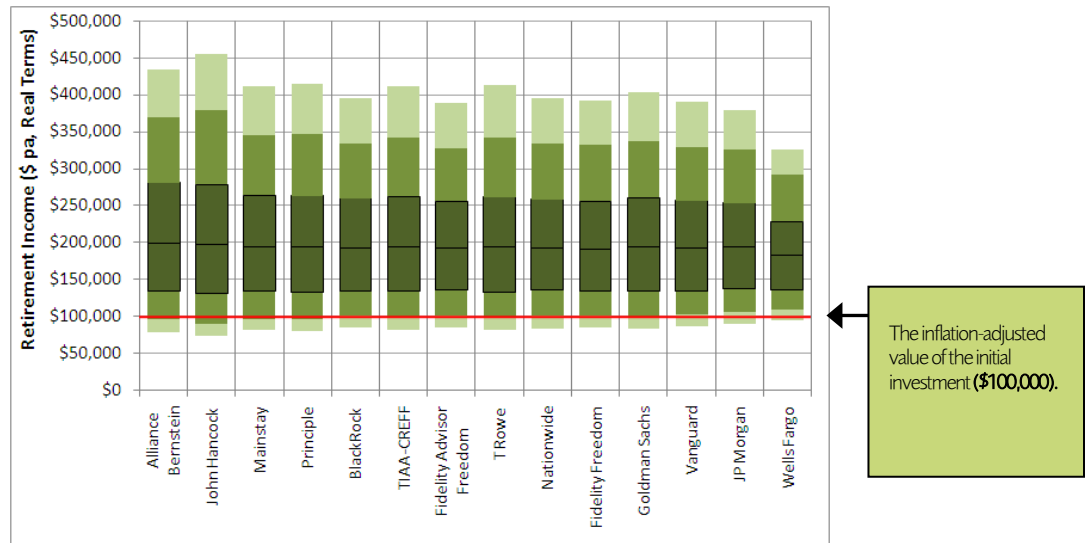
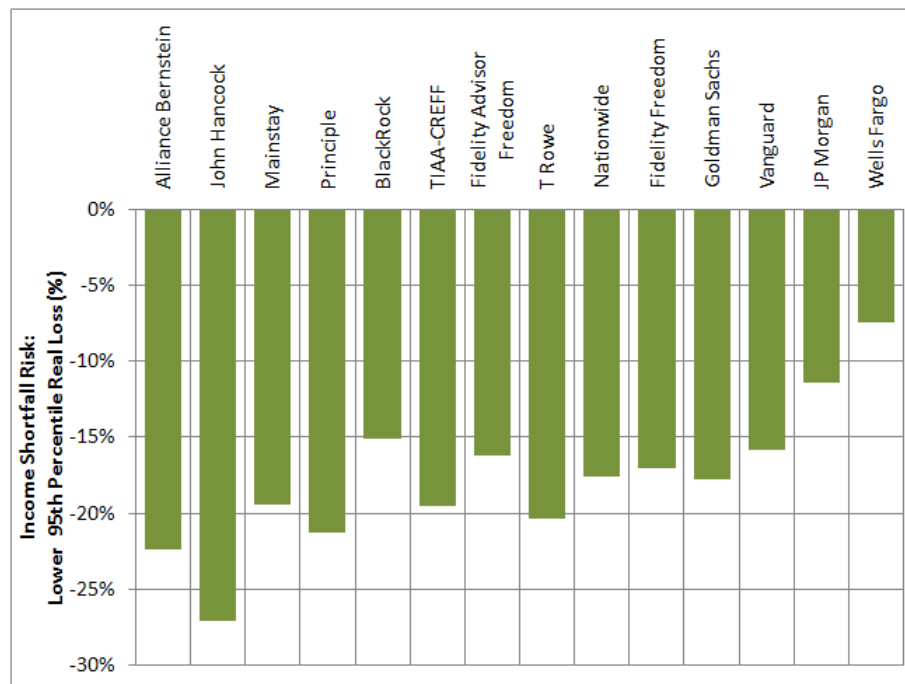


Exhibit 3 suggests that variations in the asset allocation glide-paths of the different US Target Date funds may have limited impact on the value of the accumulated fund when projected through the entire 15 year accumulation phase. With the exception of the Wells Fargo glide-path, the median real fund values all fall in the range \$191,000 to \$199,000 and the risk of the fund falling in real value terms is around 10%.

However, the picture looks different when we focus on the lower 'tail' of these accumulation profiles – the small risk of significant loss. Exhibit 4 uses the projected lower 95th percentile of the real value of the fund at retirement as a measure of the potential loss or shortfall risk, relative to the initial investment of \$100,000.

Exhibit 4:

Income Shortfall Risk: Proportional Loss in Real Fund Value through Accumulation Phase (Lower 95th Percentile)



This initial analysis might be particularly useful if our investor was primarily concerned with mitigating the risk of significant loss in the real value of their fund or income at retirement. This shows that increasing the equity exposure within the fund can have a significant impact on the risk of losing money, even over a 15 year accumulation period. For funds with the higher equity exposure, there is a 5% chance that the investor could lose 20-25% of the value of their investment (in real terms) over the entire 15 year accumulation phase.

Accumulation: within-horizon risk

Exhibit 4 provides a measure of risk for the various Target Date funds across the entire accumulation phase – 15 years in this case study. Although the risk of cumulative loss over the accumulation term is important, retirement investors are also concerned with the risk of large investment losses at any point during the accumulation phase. Large losses are a particular problem in the final years before retirement, where the capacity to mitigate such losses (e.g. by increasing the funding level) is likely to be diminished. This can be described as **'within-horizon' risk**.

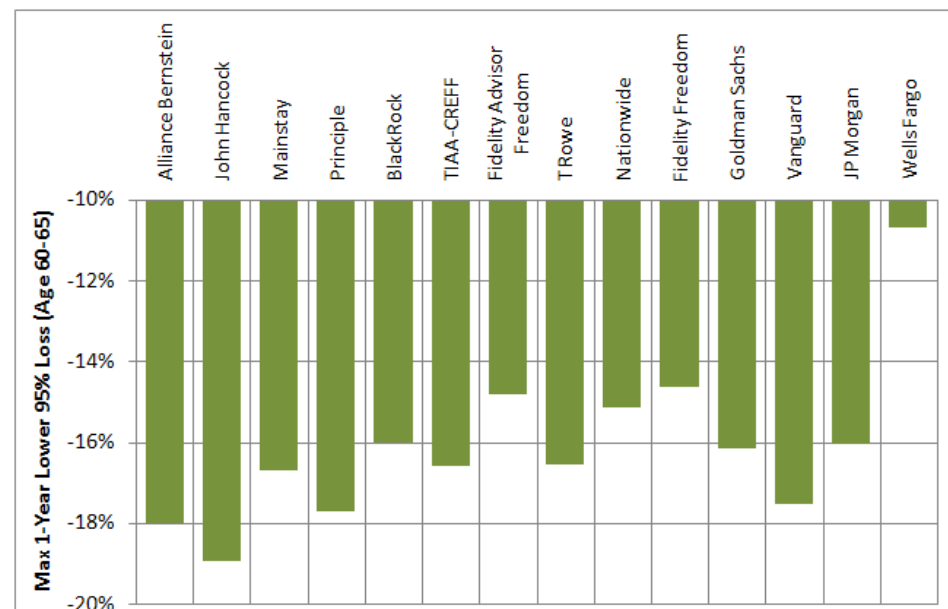
Consideration of within-horizon risk is particularly important in any evaluation of Target Date funds. Many of these funds are designed and marketed on the basis that they reduce the risk of significant losses as the investor approaches the target date (i.e. retirement). Importantly, it is also at this point in the retirement investment lifecycle where the asset allocations of the different Target Date funds appear to diverge.

In this context, it should not surprise us that the wide dispersion in the performance of different 2010 Target Date investments caused confusion and led to much negative attention during 2009.

Exhibit 5 considers 'within-horizon' risk: the lower 95th percentile value for the fund loss in the final year before retirement. Any gains or losses here will translate directly into gains or losses in retirement income.

Exhibit 5:

Within-Horizon Risk: Lower 95th Percentile Fund Loss in Final Year before Retirement Target Date



The results in Exhibit 5 confirm that there are significant differences in the extent of 'within-horizon' risk between the different funds. In the glide-paths with the highest equity allocations, there is a 5% chance of losses of a least 18-20% of the fund value – translating into an 18-20% fall in retirement income. At the more extreme 1st percentile, the potential within-term loss on these funds increases to up to 30%. For funds with lower equity exposures close to the Target Date, the 5th percentile within-term loss falls to 10-15% of fund value. Broadly speaking, this measure of

within-horizon risk roughly reflects the 2008 experience, where a number of the 2010 funds experienced losses of 20-30%.

Accumulation phase: summary

In Exhibits 4 and 5, we have considered two different risks facing Target Date fund investors during the accumulation phase of the retirement investment lifecycle. Based on this analysis, together with the consideration of expected income growth in Exhibit 3, it seems that funds at the lower end of the equity allocation spectrum manage to deliver similar levels of expected income at retirement, but with reduced risk of income shortfall or of an uncomfortably 'rough landing'. Less uncertainty in the final few years should simplify retirement budget planning and would appear to suggest that taking additional risk through the accumulation phase may have limited benefit.

However, this would consider only half of the Target Date 'glide-path'. The asset allocation and risk profile in the accumulation phase cannot be detached from the investor's requirements in the decumulation phase.

Decumulation phase

As described earlier, we will assume our retirement investor withdraws an annual income equal to 7% of the fund accumulated at the retirement target date. To keep this example simple, we will assume this income is fixed in monetary terms; although retirement investors face inflation risk during decumulation, retirement planning will often begin on the basis of a 'level' income stream during retirement.

Broadly, there are two important risks faced by the investor during the decumulation phase:

- + **Longevity Risk:** Exhibit 2 illustrated that this withdrawal strategy means the investor risks running out of money before they die (see 'B' in Exhibit 2b).
- + **Market Risk:** This has also been described as 'sequence of returns risk'. This is the risk that the investor suffers a bad sequence of returns during the early part of the decumulation phase - the point in the retirement lifecycle where the accumulated funds are greatest and there is the most to lose! Such a sequence of returns can undermine the sustainability of the retirement income stream.

Whether a fund is positioned on the "Target to Retirement" or "Target through Retirement" spectrum should in part reflect the fund provider's approach to managing these two risks. In general, glide-paths which 'flat-line' at retirement aim to mitigate the risk of a bad 'sequence of returns'. Others aim to mitigate longevity risk by holding assets with higher growth potential during the early part of the decumulation phase and then migrating to lower risk assets over a 10-20 year period through decumulation.

Let us consider these two risks in turn.

Decumulation: longevity risk

This is the risk that the investor 'outlives' the income stream generated by the retirement fund. In practice, there are a number of ways a retirement investor may be able to mitigate this risk, but for many customers with no other source of retirement income, the risk of running out of money in the last few years of their life is a very real concern.

In our simple case study, we have assumed the investor adopts a very simplistic retirement income strategy: withdrawing a fixed annual income equal to 7% of the value of the fund at the retirement date. For example, if the fund is worth \$200,000 at retirement, the investor will withdraw a fixed annual income of \$14,000. We will assume that the investor makes no adjustment in this income level to account for price inflation during retirement and that they will keep withdrawing this income until they die, or run out of money.

As a measure of longevity risk for a chosen target date retirement fund, we can use our model to estimate the median retirement term over which the investor's chosen level of income can be sustained; the 'Sustainable Retirement Term (SRT)'. Exhibit 6 illustrates the relationship between the average equity allocation through the decumulation phase and the median SRT for the 14 Target Date funds in our sample:

Exhibit 6

Equity Allocation at Target Date (%) vs. Median Sustainable Retirement Term (Years), Based on Fixed 7% Annual Income.

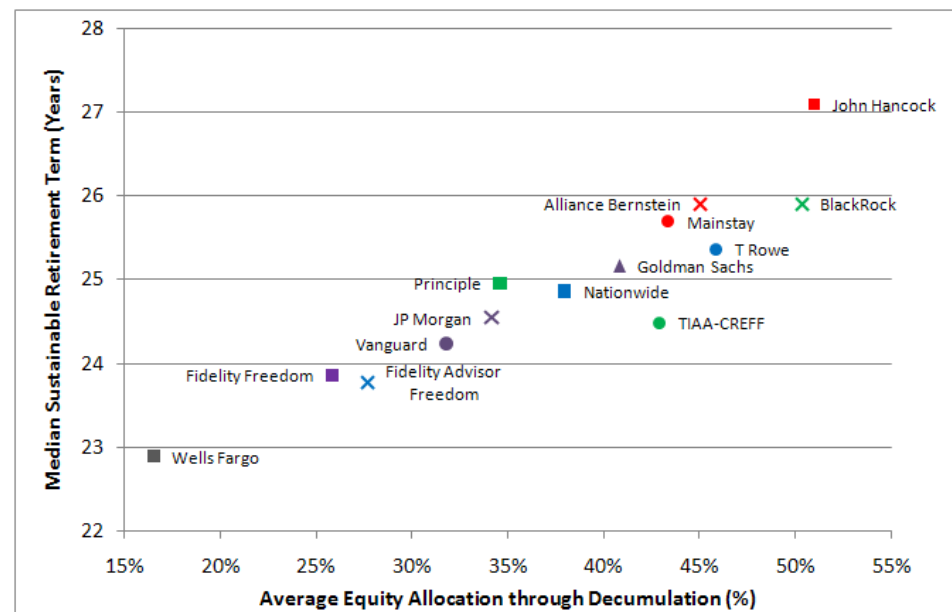


Exhibit 6 highlights a clear relationship between the Sustainable Retirement Term and the average equity allocation through the decumulation phase; those funds with higher equity exposure through the decumulation phase do seem to offer a degree of protection against individual longevity risk. While the Sustainable Retirement Term (SRT) for funds with the higher equity exposures is around 26-27 years, for funds with lower equity allocations the SRT falls to around 23-24 years. In other words, there is around a 4 year variation in Sustainable Retirement Term across the different Target Date funds in our sample.

Interestingly, funds which have particularly high equity allocations in the first 5 or 10 years after retirement seem to be most effective at mitigating longevity risk. The glide-paths associated with the Alliance Bernstein and Mainstay funds fall into this category. Funds with high average equity allocation, but where the glide-path is 'flat' through the decumulation phase, seem to be somewhat less effective in this regard.

It is important to note that the SRT for a given target date fund will depend not only on the asset allocation glide-path but also on the investor's retirement income cashflow profile.

Decumulation: market risk (sequence of returns risk)

In this final Retirement Risk Metric, we consider the retirement investor's exposure to a poor sequence of returns during the early years of the decumulation phase. In particular, we will measure the extent to which this market risk can undermine the long-term sustainability of the retirement income stream.

In the previous section, we used our stochastic model to estimate the median Sustainable Retirement Term (SRT). This is the term over which the investment fund can sustain the specified level of income. The analysis presented in Exhibit 6 showed us that the average SRT was around 25 years.

Now let us suppose that the market experiences a significant fall in value during immediately after the start of the decumulation phase. We can use our stochastic model to simulate the distribution of market scenarios in order to construct an appropriate stressed 'sequence of returns':

- + In the first year of retirement, assume the underlying investment fund suffers a 1 in 20 event (i.e. lower 95th percentile return).
- + We then use the stochastic model to project retirement outcomes from that point, and calculate the lower 95th percentile value for Sustainable Retirement Term.

By recalculating the SRT under this stressed sequence of returns, the investor is able to answer the question: "How much is could my Sustainable Retirement Term (SRT) fall due to a poor 'Sequence of Returns'?"

We can use our stochastic model to estimate how many years of retirement income would be lost under such a stress case scenario for each of the Target Date glide-paths in our sample:

Exhibit 7

Sequence of Returns Risk: Reduction in Sustainable Retirement Term under Stress Scenario

	Equity Exposure at Retirement Date	Median Sustainable Retirement Term, SRT (Years)	SRT After Stress Scenario (Years)	Sequence of Returns Risk: Reduction in SRT (Years)
Alliance Bernstein	65%	25.9	12.4	-13.5
John Hancock	56%	27.1	12.4	-14.7
Mainstay	55%	25.7	12.6	-13.1
Principle	54%	25.0	12.6	-12.4
BlackRock	52%	25.9	13.0	-12.9
TIAA-CREFF	52%	24.5	13.1	-11.4
Fidelity Advisor	51%	23.8	13.3	-10.5
T Rowe	50%	25.4	13.1	-12.2
Nationwide	49%	24.9	13.3	-11.6
Fidelity Freedom	45%	23.9	13.4	-10.5
Goldman Sachs	45%	25.2	13.4	-11.8
Vanguard	42%	24.2	13.6	-10.6
JP Morgan	40%	24.5	14.3	-10.3
Wells Fargo	24%	22.9	15.1	-7.8

These results show us that the sustainable retirement term can be reduced very significantly by a poor sequence of returns. As we would expect, there is a clear relationship between the equity exposure at the retirement date, and the fund exposure to this market or 'sequence of returns' risk; there is a clear trade-off between exposure to the longevity risk and exposure to market risk, or a poor sequence of returns. This suggests that a consideration for investors who elect to take greater market risk during decumulation should be willing to adjust their expectations more radically under stressed market conditions such as 2008.

Summary: a retirement risk dashboard for evaluating target date funds

Information about the asset allocation glide-path alone does not provide the investor, advisor or plan sponsor with an explicit measure of the risks in a particular Target Date fund, or enable the participant to evaluate the fund against their own financial planning requirements or risk profile. In particular, retirement investors should be considering the following key questions when selecting an appropriate Target Date fund:

- + What risk is of greatest concern to me... longevity risk or market risk?
- + Am I willing to accept the level of these risks inherent in a particular Target Date investment?
- + At which point(s) in the retirement investment lifecycle is my risk exposure most acute?

The following table (Exhibit 8) summarises the different Retirement Risk Metrics described in the previous sections for the different asset allocation glide-paths associated with the 14 Target Date funds in our sample. This summary illustrates how the different Retirement Risk Metrics can be used as a 'Dashboard' for evaluating different products in relation to the key risks facing the retirement investor.

For each of the four Retirement Risk Metrics shown in the table, green shading represents lower risk, red shading represents higher risk.

Exhibit 8

Retirement Risk Metrics: A Risk Dashboard for Evaluating Target Date Funds

Fund	Accumulation Phase		Decumulation Phase	
	Income Shortfall Risk: Lower 95th Real Income Loss	Within-Horizon Risk: Max Lower 95% Loss (Age 60-65)	Longevity Risk Median SRT (Years) at 7% Fixed Income	Market Risk Sequence of Returns Risk: (Reduction in SRT Years)
Alliance Bernstein	-22%	-18.0%	25.9	-13.5
John Hancock	-27%	-18.9%	27.1	-14.7
Mainstay	-19%	-16.7%	25.7	-13.1
Principle	-21%	-17.7%	25.0	-12.4
BlackRock	-15%	-16.0%	25.9	-12.9
TIAA-CREFF	-20%	-16.6%	24.5	-11.4
Fidelity Advisor Freedom	-16%	-14.8%	23.8	-10.5
T Rowe	-20%	-16.5%	25.4	-12.2
Nationwide	-18%	-15.1%	24.9	-11.6
Fidelity Freedom	-17%	-14.6%	23.9	-10.5
Goldman Sachs	-18%	-16.1%	25.2	-11.8
Vanguard	-16%	-17.5%	24.2	-10.6
JP Morgan	-11%	-16.0%	24.5	-10.3
Wells Fargo	-7%	-10.7%	22.9	-7.8

This 'dashboard' shows how the different Retirement Risk Metrics developed in this note can be used to explain and quantify risk in the asset allocation glide-paths associated with each of the Target Date funds. By addressing key questions such as those listed above, the Retirement Risk Metrics summarised in Exhibit 9 provide investors, advisors and plan sponsors with the information necessary to make informed decisions about which default funds suit their retirement planning needs and risk profile.

Barrie & Hibbert provide a range of scenario risk modelling software products and services to enable our clients to calculate the Retirement Risk Metrics described in this note. There are a variety of delivery platforms designed to suit the needs of investors, advisors and product manufacturers.

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