

Liability-responsive asset allocation



Defining the de-risking glide path for defined benefit pension plans

Russell Investments Research / Viewpoint



"...liability hedging programs that include the adoption of a risk reduction objective as part of the long-term investment strategy. Under this objective the interest rate hedge is intended to increase as funded status improves."¹

"...a broad global de-risking strategy which increases the matching characteristics of our assets relative to our obligation as funded status improves. Our de-risking strategy has increased the allocation to fixed income investments and reduced our funded status sensitivity to changes in interest rates."²

The statements above are taken from the annual reports of the sponsors of two of the largest defined benefit (DB) pension plans in the United States. They describe asset allocation policies that vary with the funded status of the plans, meaning that changes in the value of pension liabilities automatically lead to changes in asset allocation.

Such liability-responsive asset allocation (LRAA) policies – and the de-risking glide paths resulting from those policies – have become widespread since they first appeared around 2008. In a 2019 CIO Magazine survey of corporate pension plans, 69% of frozen-plan respondents indicated that they had a glide path in place, and a further 8% that they planned to do so.³

This paper discusses the brief history of the strategy, then explains the rationale for the approach, and finally, lists some of the design considerations that go into implementing such a program.

A brief history of LRAA

De-risking glide paths are relatively new, having first appeared around 2008. Our 2009 paper, "Liability-Responsive Asset Allocation,"⁴ was (as far as we are aware) the first formal documentation of the concept of a de-risking glide path.

There are two main reasons that such policies were not adopted earlier. First: frozen plans were less common.⁵ Second: practical considerations – notably regarding the timely availability of estimates of funded status and the ability to pull the trigger on changes to the asset allocation policy – would have made the implementation of such a policy much

more difficult than it is today. Until recently, funded status was calculated just once a year and results were only available several months after the effective date. Meaningful estimates of the situation between times would have been expensive or impossible to obtain. Indeed, even in our 2009 paper, we envisioned LRAA as being based on monthly or even quarterly monitoring. Today, daily estimates are fairly easy to obtain and a common offering from service providers.

Only once it was a practical possibility were we able to ask, as we asked in that earlier paper: “If a pension plan decides to allocate 60% of its portfolio to return-seeking assets (such as equities) when its funded status is 70%, but knows that it would have only a 20% allocation if its funded status were 110%, then why would that plan not track its funded status and dynamically adjust the allocation accordingly?”

This question was given extra weight by the fact that the typical plan had been strongly funded in the recent past. Many decision-makers looked back to 1999 and 2007 and said, “When we get to that position again, we should lock it in.” An LRAA schedule makes this intent a formal policy.

The Pension Protection Act of 2006 (PPA) also had an effect. By intensifying the focus on asset allocation and accelerating the shift to a marked-to-market mindset, PPA created conditions that were more receptive to a dynamic approach. Reviews of asset allocation, which previously might have been carried out on a three- or even five-year cycle, became annual events. The question of asset allocation is now never far from an investment committee’s agenda.

Following its arrival on the corporate DB scene around 2008, the concept of LRAA spread remarkably quickly. Although pension plans are often seen as conservative and slow to adopt new ideas, de-risking glide paths were widely embraced almost immediately.

The typical U.S. pension plan experienced an improvement in funded status from 2010 to 2013 of 10% to 25% (depending on contribution policy and other factors). Hence, most plans that had adopted LRAA schedules hit a number of trigger points over that period, the result being a general move away from return-seeking to liability-matching assets. The pace of de-risking has slowed since then as falling interest rates through early-2016 prevented funded status from improving much, except in isolated quarters.

While LRAA has not become standard terminology across the industry, whatever your preferred term, we have now reached the point where most frozen pension plans have adopted a de-risking glide path, and it is those who have not done so that find themselves in the minority.

Why (and when) LRAA makes sense

To understand the rationale for LRAA, it is best to begin with the case of a frozen pension plan (i.e., one that is no longer providing any new benefit accruals). The two highest-level categories to which the plan’s assets are allocated are liability-matching assets (typically long-dated fixed income) and return-seeking assets (the largest component of which is generally equities). The division of assets between those two categories is based on a risk/return trade-off. This trade-off may be expressed, for example, in terms of how the allocation decision is expected to affect the funded status and the contributions that the sponsor will be required to make in future years.

Exhibit 1 is a generic representation of the typical risk-reward trade-off. Higher reward in this case means lower expected plan sponsor contributions on average, while higher risk means greater variability and/or higher contributions in less-favorable scenarios.

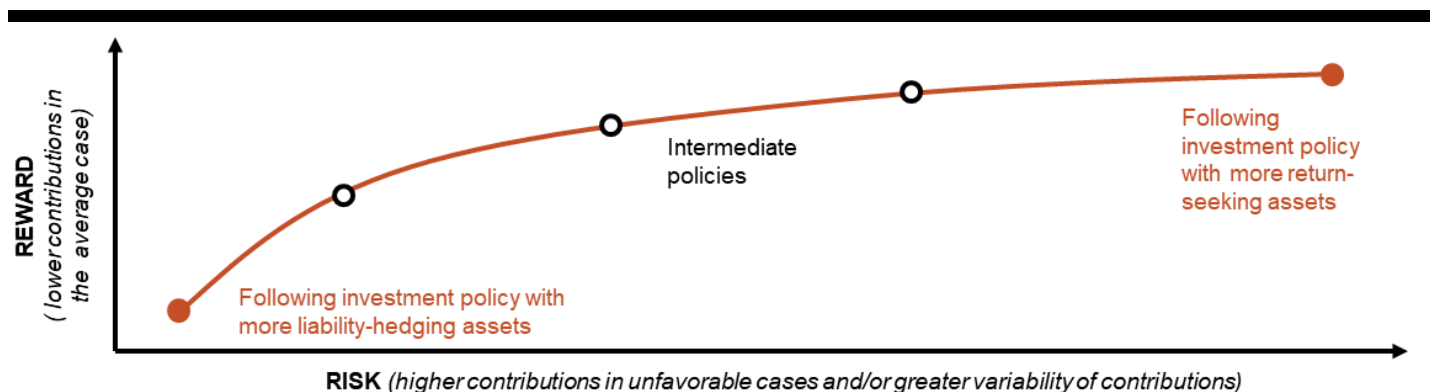
The pattern shown in Exhibit 1 is what might intuitively be expected: an increased allocation to return-seeking assets results in a lower contribution being required on average, but there is greater volatility and/or greater uncertainty associated with that outcome.

In other words, a return-oriented portfolio leads to higher expected reward but also to higher risk. This is a familiar pattern for investors of all types.



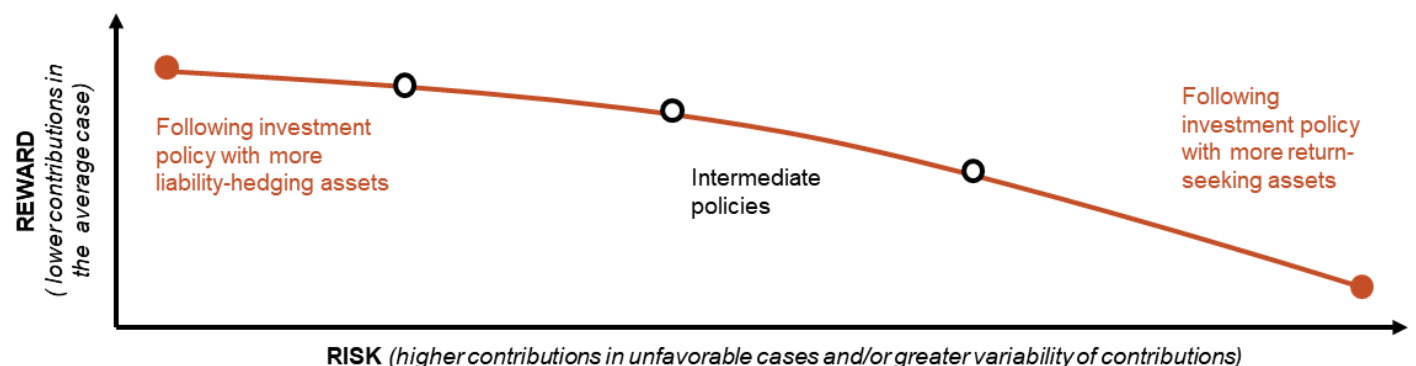
In other words, a return-oriented portfolio leads to higher expected reward but also to higher risk.

Exhibit 1: Typical risk-reward trade-off



For illustrative purposes only.

Exhibit 2: Example of well-funded risk-reward trade-off



For illustrative purposes only.

However, a different pattern results when the analysis is run for a plan that is well funded. Now the trade-off may look more like what is shown in Exhibit 2.

In this case (Exhibit 2), the return-oriented investment strategy continues to lead to higher risk, but it no longer compensates for that risk with a better expected outcome. The assumption that the plan is fully funded and no new benefits are accruing means that, in average and favorable conditions, required contributions are expected to be small or zero no matter what the investment strategy. There's little to gain by taking risk in pursuit of extra returns in this scenario. (We'll come back in a moment to what happens when we remove the assumption that no new benefits are accruing.)

Thus, while an underfunded frozen plan may well choose to follow a return-oriented investment strategy in order to close a funding gap, the case for doing so weakens as funded status improves. This relationship can be embedded in the asset allocation policy by tying the strategy to variations in funded status over time. Rather than simply setting the allocation based on the current funded status, a schedule can be produced that specifies what the allocation would be at various funded levels.

The LRAA schedule creates, in effect, a de-risking glide path that is intended to take the plan from an initially underfunded state (with some risk being taken in the investment policy) to a fully funded state with minimal risk.

In practice, such a schedule might look something like this:

Exhibit 3: Sample LRAA de-risking schedule

FUNDED STATUS TRIGGER	LIABILITY-HEDGING FIXED INCOME ALLOCATION	EQUITY OR RETURN-SEEKING ALLOCATION
Below 85% (initial position)	35%	65%
85%	45%	55%
90%	55%	45%
95%	65%	35%
100%	75%	25%
105%	85%	15%

For illustrative purposes only.

We describe in more detail later in this paper the steps involved in creating an LRAA schedule.

“ The LRAA schedule creates, in effect, a de-risking glide path that is intended to take the plan from an initially underfunded state to a fully funded state with minimal risk.

Trapped capital; LRAA for open/closed/frozen plans

LRAA replaces a static asset allocation policy with a dynamic one. The dynamism is not, however, in response to any change of opinion regarding the nature of the asset class opportunities faced by the plan.⁶ Rather, it is dynamic only in response to the plan's circumstances. Specifically, the allocation responds to changes in funded status and to the impact of those changes on the risk-reward trade-off inherent in the asset allocation decision. It fits into the category of strategies described as long ago as 1990 by Bill Sharpe as "intended to better adapt long-run results to an investor's objectives, without attempting to time the market."⁷

The reason that the risk-reward trade-off varies in our example is that at 85% funded, additional returns serve to reduce the shortfall and hence save the plan sponsor money; whereas at 105% funded, additional returns have little or no impact on the level of required future contributions. The extra money is in danger of becoming capital trapped within the plan. If it were possible to return surplus assets without penalty to the plan sponsor, the possibility of trapped capital would not be a consideration, and the pursuit of extra return would be as worthwhile for the sponsor of a 110% funded plan as it is to the sponsor of a 70% funded one. However, there are practical barriers to the return of plan surplus, including a significant tax penalty, so the effective value of an extra dollar in the plan is less at higher funded levels.

A plan that is closed to new entrants but still accrues new benefits for existing members is in a similar, but not identical, situation. For such a plan, extra returns serve to offset the cost of new benefit accruals. Capital would only become trapped after all future benefit accruals are fully funded. For this reason, LRAA strategies for closed plans that have not frozen all benefit accruals may consider the present value of all future benefits (PVFB) funding metric rather than just the projected benefit obligation (PBO) when designing a de-risking glide path.

In the case of an open pension plan, LRAA has a more limited application. Typically, the pattern of the trade-off between risk and return does not vary a lot as funded status changes for open plans. LRAA strategies are therefore less common among these plans. In the *CIO Magazine* survey cited earlier, for example, only 31% of open plans indicated that they had a glide path in place compared to 70% of frozen plans.⁸



Specifically, the allocation responds to changes in funded status and to the impact of those changes on the risk-reward trade-off inherent in the asset allocation decision.

Design considerations

At its core, LRAA is simple and intuitive. It replaces the traditional asset allocation policy (consisting of a fixed mix of assets) with a dynamic policy that depends on the funded status of the plan.

In practice, there are a number of elements that go into the design of an LRAA schedule. These include:

The liability metric that is used

It is most common to base an LRAA policy on the PBO calculated for corporate accounting purposes, since this is the most objective measure of marked-to-market liabilities that is easily available and it is directly related to how the plan affects the corporate balance sheet. As noted previously, PVFB may be used for a plan that is closed to new entrants but has not frozen new benefit accruals. Accumulated benefit obligation (ABO) may also be used.

End goal funding objective

The point at which surplus in a pension plan becomes trapped capital is somewhere above the 100% funded position, generally at least 105%. If the intention is to move quickly to a full plan termination, then a target of 110% or higher may be adopted in order to ensure that sufficient funds would be available for the fully loaded cost of transferring all liabilities to the insurance sector.

End goal asset allocation

The end goal asset allocation is the policy associated with the end goal funding objective, the highest funded status in the LRAA schedule. This might be designed to mirror the liability characteristics as precisely as possible (e.g., with a bond portfolio based on matching the key rate durations to the expected liability cash flows). A small, diversifying allocation to return-seeking asset classes is often retained, however, since this may help to minimize the expected variability of the plan surplus.

Initial asset allocation policy

This is the asset allocation policy appropriate for the current funded status, typically established via an strategic asset allocation review.⁹

Permit re-risking? (one-way or two-way policies)

Although glide paths are primarily intended to define what happens when funded status increases, they also need to be clear on what happens when funded status falls. Should a plan move back to a higher-risk asset allocation policy when this happens?

Even though the primary line of logic for adopting an LRAA schedule would lead to a two-way glide path, many plans have chosen to follow a one-way path (i.e., not to reduce liability-hedging allocations when funded status falls). This avoids excessive trading as funded status ebbs and flows, and it highlights the value that many plans place on LRAA as a practical means of finding a way to a desired end goal: full funding and minimal risk.

Confirm glide path

Having established a starting policy (applicable to the current funded status) and an end-goal policy (applicable to the funding objective), a simple glide path can be constructed by defining equal incremental changes to asset allocation policy as funded status hits each trigger point between the current and end objective funded status. Five percent intervals are common, but smaller trigger intervals may be desired in some circumstances, such as for very large plans (that desire smaller asset allocation shifts).

More complex approaches are possible, such as changing asset allocation policy more quickly as funded status moves up initially in order to get closer to the final policy goal. Such fine-tuning of glide paths is unusual, however.

If a two-way glide path is chosen, the schedule may be extended to specify asset allocations that apply at levels below the initial funded status.

Establish tactical ranges (if desired)

Ranges may be established around the targeted glide path to permit discretionary variation of the asset allocation in order to implement tactical market views. For example, the policy ranges may specify that the actual allocation to return-seeking assets cannot be higher than the next-higher allocation on the glide-path schedule, nor lower than the next-lower allocation.

If the investment policy does not allow for tactical variation in the allocation, rebalancing ranges may be specified instead.

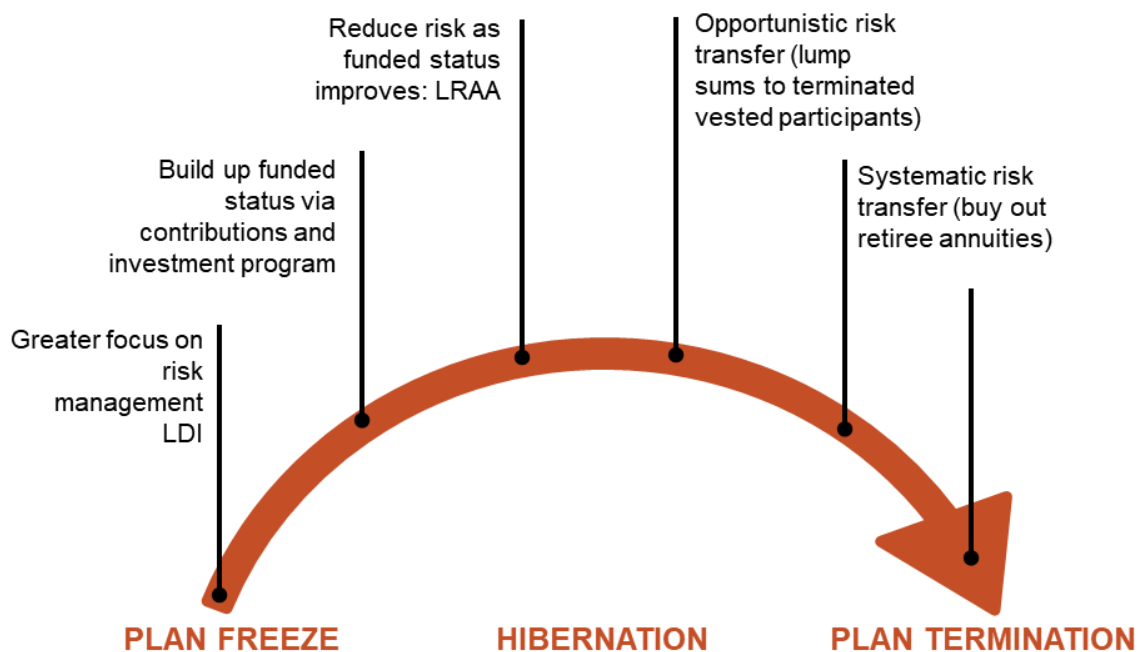
Define the return-seeking portfolio

The allocation of assets within the return-seeking portfolio may change as funded status increases. Of particular note here is the handling of illiquid assets; there may be little control over the pace at which these can be reduced so planning ahead is important to avoid over-allocation as the end goal funding objective is approached.¹⁰

Define the liability-hedging portfolio

Similarly, the liability-hedging portfolio may change as it grows. If the liability-driven investment (LDI) portfolio is much smaller than the liabilities being hedged, there is little to gain by fine-tuning to the specific liabilities of the plan. The portfolio may simply aim to achieve the maximum possible sensitivity to interest rates.¹¹ Once the portfolio is large enough, more precise hedging becomes possible.

Exhibit 4: The typical lifecycle of a frozen pension plan



Source: Russell Investments

Define the hedge ratio

An additional enhancement to an LRAA schedule is to define a target range for the interest rate hedge ratio. While not providing a specific LDI duration, hedge ratio target ranges can help guide and influence the composition of LDI assets. Early in a glide path, the sponsor may need to retain a higher LDI duration to achieve the desired hedge ratio, while later in the glide path the LDI will probably have a similar duration to the liabilities.

Other variables

Once the asset allocation policy is tied to funded status, plans may consider whether to tie it to other variables. A glide path may be made contingent on the level of interest rates, or to the passage of time (the latter goal, again, as a reflection of the intent to advance to the known end goal).

Implementation of policy changes

LRAA is most effective if policy changes apply automatically once a funded status trigger is hit. In some cases, however, LRAA schedules are advisory rather than automatic (a “guide path,” if you will), and changes in asset allocation require investment committee approval before being put into effect. This reduces the responsiveness of the policy and introduces an additional layer of bureaucracy. Advisory schedules should require, whenever de-risking triggers are not acted on, clear documentation of the conditions that led to the decision not to act. Those conditions ought to be subsequently monitored so that de-risking action can be taken when they no longer apply.

A de-risking glide path will lead, over time, to several changes in asset allocation. Procedures should be established to ensure those changes are made as efficiently and as cost-effectively as possible. This should include explicit procedures around the handling of plan-sponsor contributions. Specifically, if the contribution will cause the funded status to cross a trigger point, the investment of the new money should be based on the asset allocation applicable to the higher funded status.

Conclusion: Keep the end in mind

LRAA and de-risking glide paths have come to prominence against the backdrop of a maturing pension system. A substantial number of plans have now been frozen for 10 or more years, over which period the nature and the time horizon of the liability profile have evolved.¹²

Against this changing backdrop, LRAA should be seen as a transitional strategy, carrying a plan through the early stages of the frozen-plan lifecycle. As a plan approaches full funding, the focus on risk management intensifies. The end goal is to transfer all liabilities to participants and the insurance sector and to terminate the plan; making this move prematurely can be expensive, however, so there is generally a period – referred to as hibernation¹³ – during which plan assets and liabilities are retained.

Exhibit 4 depicts the stages represented in the typical progression of a frozen plan. The pace at which any given plan will advance through this lifecycle depends on a number of variables. Interest rates are especially important. A sharp increase in interest rates could accelerate the progression toward full funding, in turn leading to a faster shift from return-oriented assets to hedging assets, to increased risk transfer activity, and even to some plan terminations. If, however, interest rates remain low by historical standards, these changes will come more slowly. Funded status is also affected by the strength of the equity market and by plan-sponsor contribution policy; so these, too, will affect the pace of change.

Regulatory changes, , developments in the pension risk transfer market or changes to the level of PBGC premiums potentially serve as a brake or a boost to the progression of pension plans through the various stages of the typical lifecycle shown in Exhibit 4. The popularity of LRAA and the widespread adoption of de-risking glide paths offer clear evidence that the U.S. retirement system is not static. Although we cannot say how quickly, the system is clearly moving toward a future in which DB will play a greatly reduced role.



The popularity of LRAA and the widespread adoption of de-risking glide paths offer clear evidence that the U.S. retirement system is not static.

¹ United Technologies Corp., Form 10-K for FYE 2019

² Ford Motor Company, Form 10-K for FYE 2019

³ "2019 Liability-Driven Investment Survey," *CIO Magazine*, November 5, 2009.

The response of 69% of frozen plans to the question "Glide path in place?" was either "Yes, written into IPS as a contract," "Yes, written into IPS as an intent" or "Yes, but not written into IPS." 8% responded "No, but plan to," and the remaining 23% responded "No, and no plans to."

⁴ Gannon, J. and B. Collie (2009). "Liability-responsive asset allocation," *Russell Investments Viewpoint*.

⁵ The most recently available PBGC pension insurance data shows that the percentage of plans with a freeze on either accruals or participation rose between 2008 and 2016 from 27.9% to 34.5%, and the percentage of active participants with frozen benefits has increased from 8.3% to 21.3%.

⁶ This statement is not intended to dismiss the possibility of responding to changes in the nature of asset-class opportunities. Rather, it is to note that it is not the subject of this paper.

⁷ "Managing Investment Portfolios: A Dynamic Process," edited by John Maginn & Donald Tuttle. Chapter 7. (Second Edition, 1990. Warren, Gorham & Lamont.)

⁸ *CIO Magazine* op. cit.

⁹ See J. Owens (2020). "DB Strategic Asset Allocation Reviews"

¹⁰ See Gannon, J. and K. Turner (2013) "Structural denominator effects and implications for private market investments in DB pension plans" *Russell Investments Practice Note*.

¹¹ See Phillips, D. & others (2014). "Hedge long first: an alternative approach to LDI." *Russell Investments Viewpoint*.

¹² PBGC Annual databooks <http://www.pbgc.gov/prac/data-books.html>

¹³ See Owens (2019). "A guide to pension plan hibernation." *Russell Investments Viewpoint*.

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