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Right-Risking: Helping Pension Plans Set Their Hedging Objectives

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At a glance:

- **Right-risking can help you confidently achieve your plan's funding goals**
- **While every plan is unique, all sponsors share a common goal of making better risk/reward trade-offs; so, clearly setting the hedging objectives is a critical step in the strategic asset allocation process**
- **Often facing multiple objectives, plans should make sure they are taking advantage of a full opportunity set that includes public, private and overlay market instruments**

Striking the Right Balance

De-risking gets a lot of attention. However, we believe most plan sponsors are really seeking to make better risk/reward trade-offs and improve the chances of meeting their plan obligations. This risk budgeting exercise can be impacted by many plan-specific factors, so the investment framework should recognize that all plans are different. What is most important is finding the strategies and solutions that best fit your unique risk budget and tailor your investment strategy appropriately – a process called right-risking.

A pragmatic approach and risk-management focus gives pension plan sponsors more confidence that they can achieve their funding goals with better control of their plan, regardless of market conditions. To help ensure a plan is affordable, we encourage sponsors to broaden their opportunity set and take advantage of the wide array of investments now available in the public, private and derivative markets.

We fully understand that risk must be taken to achieve attractive returns. However, we believe control of the plan comes from predictability of funding outcomes. To this end, a plan's funded status, its volatility and the associated downside risks of any contemplated asset allocation strategy must be fully understood. Right-risking requires a deep understanding of the risks facing your plan. Then informed decisions can be made around how much risk to accept and how much risk to hedge.

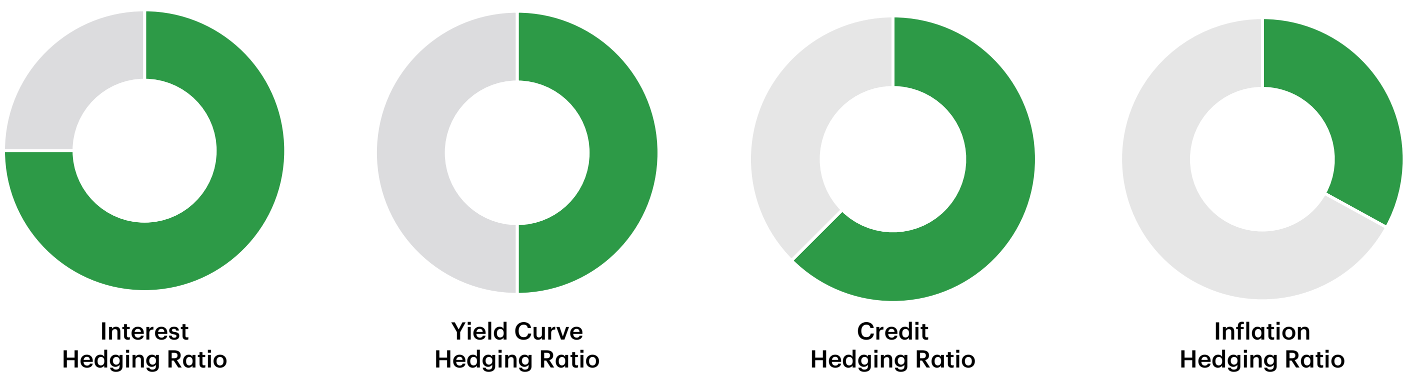
Structuring the Hedging Portfolio

Hedging generally refers to allocating a plan's assets to have similar market risk exposures as its underlying liabilities. The expectation is that these assets will experience a sensitivity to market movements in line with a portion of the plan liabilities. This helps to reduce the funded status volatility.

The Hedging Risk Dashboard

The primary market movements that impact liability volatility and may contribute to funding ratio volatility are movements in interest rates, the shape of the yield curve, credit spreads and inflation.

Figure 1: Hedging Ratio Dashboard



Source: TD Asset Management Inc.

The **Interest Hedging Ratio** measures the degree to which a plan's funded status is protected against a parallel shift in the nominal yield curve. Interest rate risk is typically the largest source of risk for a defined benefit pension plan. As a result, it is often considered the primary measure when determining how much risk a plan is taking.

The **Yield Curve Hedging Ratio** measures the degree to which a plan's funded status is protected against a non-parallel shift in the nominal yield curve. In an environment dominated by active central banks, protecting against changes in the shape of the yield curve can be of greater importance. Otherwise, hedging against yield curve movements is generally considered of secondary importance.

The **Credit Hedging Ratio** measures the degree to which the plan's funded status is protected against changes in credit spreads. The importance of this ratio depends on the liability measure. For example, the accounting basis for calculating the funded status is typically more sensitive to credit spreads than the solvency basis.

The **Inflation Hedging Ratio** measures the degree to which the plan's funded status is protected against changes in inflation expectations – i.e., a parallel move in the real yield curve, assuming nominal interest rates remain fixed. This ratio is of great importance to plans with benefits indexed to cost-of-living increases.

When strategic asset allocation is performed in a liability-aware fashion, sponsors can better understand true plan costs and the risk taken to reduce those costs. The decision to take risk should be based on whether the risk is rewarded either through higher expected returns and/or through diversification benefits from a total portfolio perspective, including the liabilities.

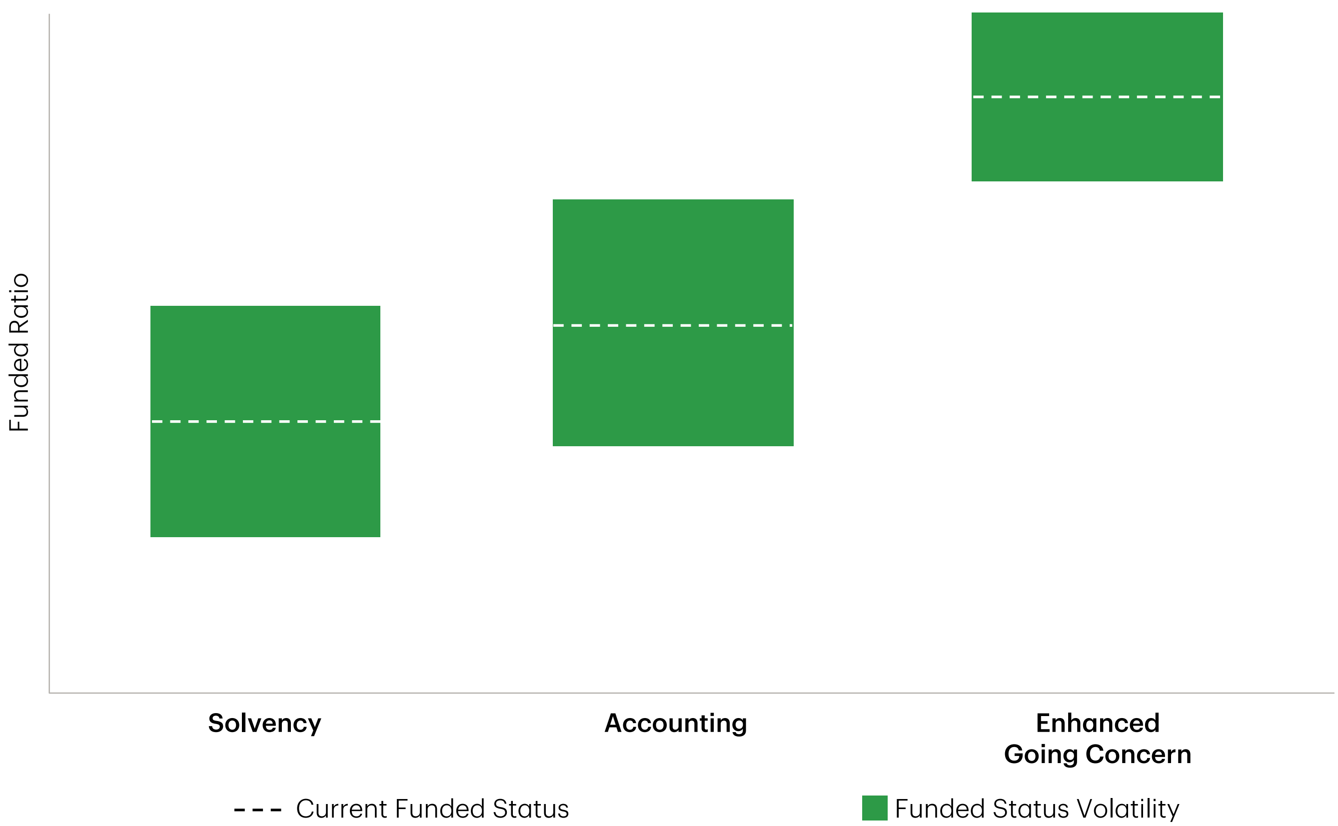
Which Liability Should Be Hedged?

While there is generally one view of a plan's assets, what complicates matters is that there are multiple measures or valuations of a plan's liability:

- **Going concern valuation:** determines liability by assuming the plan will continue to exist indefinitely
- **Hypothetical wind-up valuation:** determines liability as the cost of settling the plan benefits immediately
- **Solvency valuation:** Determines liability as the cost of settling plan benefits with some modifications prescribed by provincial funding regulations
- **Accounting valuation:** determines liability for financial statement purposes

More recently, many jurisdictions in Canada have moved to enhanced going concern methodologies that introduce an additional risk-based liability or provision for adverse deviation.

Figure 2: Most plans tend to have multiple hedging objectives



Source: TD Asset Management Inc.

Many plans will be focused on either the enhanced going concern or solvency basis given the potential impact on contributions from not being hedged. Other plans may be more focused on the accounting basis because of a sensitivity to financial statement volatility or potential adverse income implications of an eventual wind-up.

The point is that most plans may have multiple hedging objectives. The investment approach should be robust. It requires a deep understanding of the interaction between the plan's assets and liabilities, using all the relevant liability definitions to help avoid any unintended surprises.

Setting the Primary Hedging Objective

Every plan looking to right-risk must address a nuance before deciding on the hedging approach. To do this, we need to answer the question: is the focus on the plan's Funding Ratio or Funding Position? The following example helps illustrate the difference.

Figure 3: Hedging the Funding Ratio (%) versus hedging the Funding Position ($)

Hedging the Funding Ratio (%)	
Assets:	80
Liabilities:	100
Funding Ratio: Assets/Liabilities	**80%**
Funding Position: Assets – Liabilities	-20
Interest Hedge Ratio	80%
If interest rates increase 1%	
Assets:	70
Liabilities:	88
Funding Ratio: Assets/Liabilities	**80%**
Funding Position: Assets – Liabilities	-18

Hedging the Funding Position ($)	
Assets:	80
Liabilities:	100
Funding Ratio: Assets/Liabilities	80%
Funding Position: Assets – Liabilities	**-20**
Interest Hedge Ratio	100%
If interest rates increase 1%	
Assets:	68
Liabilities:	88
Funding Ratio: Assets/Liabilities	77%
Funding Position: Assets – Liabilities	**-20**

Note: Duration of liabilities is assumed to be 12 years. Source: TD Asset Management Inc.

If a plan's intention is to lock in its Funding Ratio (i.e. ratio of assets to liabilities), then it should use a target Interest Hedge Ratio equal to its Funding Ratio. On the left hand side of Figure 3, if the plan sponsor targets an Interest Hedge Ratio of 80% in line with its Funding Ratio, when interest rates change, the Funding Position (in this case a deficit) decreases in dollar terms, but the Funding Ratio remains unchanged.

We find most plan sponsors are focused on their Funding Ratio (%). This metric is also meaningful for plans seeking protection against breaching key levels, such as the 85% solvency level, which could trigger additional funding requirements. Funding Ratio hedges also tend to work well for plans on glide paths, as many glide paths are structured to align their target Interest Hedge Ratio to their Funding Ratios.

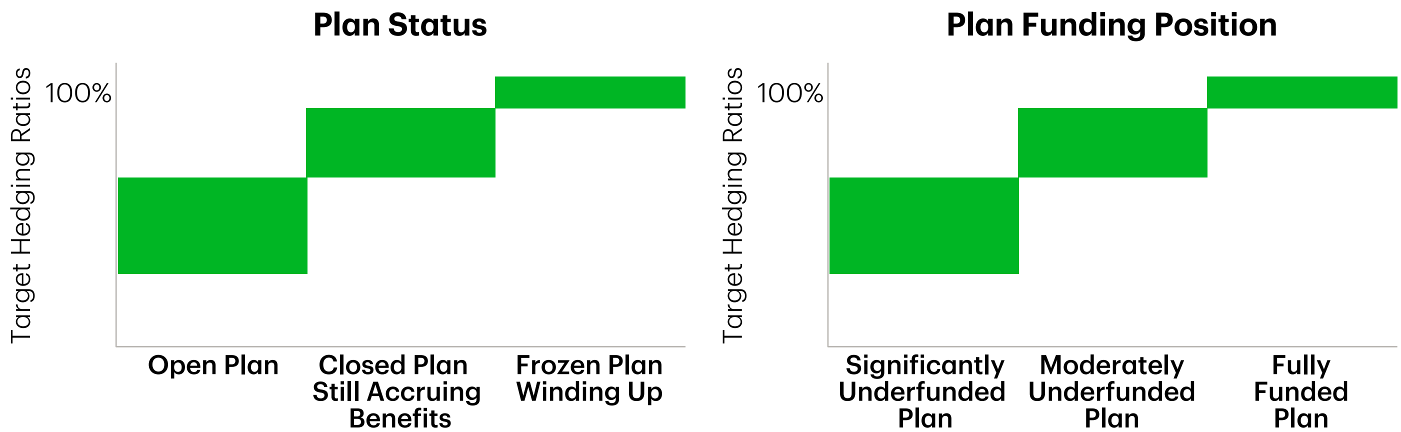
Some plans, however, are focused on their Funding Position in dollars. This could be the case for a plan nearing wind-up and seeking certainty around its dollar surplus or deficit in order to minimize the risk of a surprise in the contributions required to fully settle benefits. In this case, a plan seeking to lock in its Funding Position or dollar surplus/deficit should use a target Interest Hedge Ratio equal to 100% of its liabilities. On the right-hand side of Figure 3, an Interest Hedge Ratio of 100% certainly immunizes the dollar deficit within the plan, but it leaves the plan's Funding Ratio somewhat exposed to market movements.

By extension, a plan seeking to improve its Funding Ratio by taking advantage of interest rate movements would target an Interest Rate Hedge Ratio lower or higher than its Funding Ratio in anticipation of rates rising or falling respectively.

Setting the Target Hedging Level

The choice of target hedging level is often customized to meet a plan's specific objectives. These can vary based on many factors, including the Plan Status and Current Funding Position.

Figure 4: Factors impacting target Interest Hedging Ratios



Source: TD Asset Management Inc.

Plan Status

Open plans continue to enroll new participants and benefits continue to accrue. These plans typically have longer investment time horizons due to their larger active member populations. Having less need to generate cash flow in the short term, they can adopt a larger allocation to growth assets. With lower target hedging ratios, most open plan sponsors are willing to accept greater short-term funding status volatility while remaining liability-aware and seeking to avoid downside tail-risk funding surprises. Also, growth assets may provide some interest rate hedging over the long term.

Closed plans are either plans closed to new entrants but continuing accruals or plans in which benefit accruals are partially frozen. These plans tend to have a shorter investment time horizon. With no new members able to join the plan, the portion of retired members only grows over time. These plans may be on a glide path and seek rising rates as a tail wind to improve funded status over time.

A frozen plan seeking a wind-up would typically have the shortest investment time horizon. In many cases, these plans may aim to lock in a funding position by setting their Target Interest Hedge Ratio equal to 100% and maintaining a high degree of key rate duration matching. The range or band around this target will generally tighten as the plan's funding level improves, recognizing a small appetite for a decline in funded status and less need to grow the assets.

Plan Funding Position

Plans seeking to close funding deficits typically have three ways to do so – increasing contributions, reducing benefits or increasing investment returns. The most palatable option for plan sponsors who can accept some risk is taking the risk to improve expected investment returns. As a result, those underfunded plans will generally use lower target hedging ratios and seek tail winds from favourable market movements, including rising interest rates, to help close their gaps. However, plan sponsors who cannot accept the risk should use higher hedging ratios.

On the other hand, well funded or slightly overfunded plans will generally use higher target Interest Hedging Ratios. Additional surplus beyond a certain point is often deemed unnecessary, but there is generally a low tolerance for significant funded status declines – especially in the case of frozen plans.

Another common implementation technique is increasing the target Hedging Ratio as the plan's funding position improves. When asset allocation shifts and target Hedging Ratio changes are predetermined based on glide path triggers, the hedging manager can work in a disciplined manner to ensure opportunities are not missed and the plan not exposed to unintended asset-liability risk.

Using a Full Opportunity Set

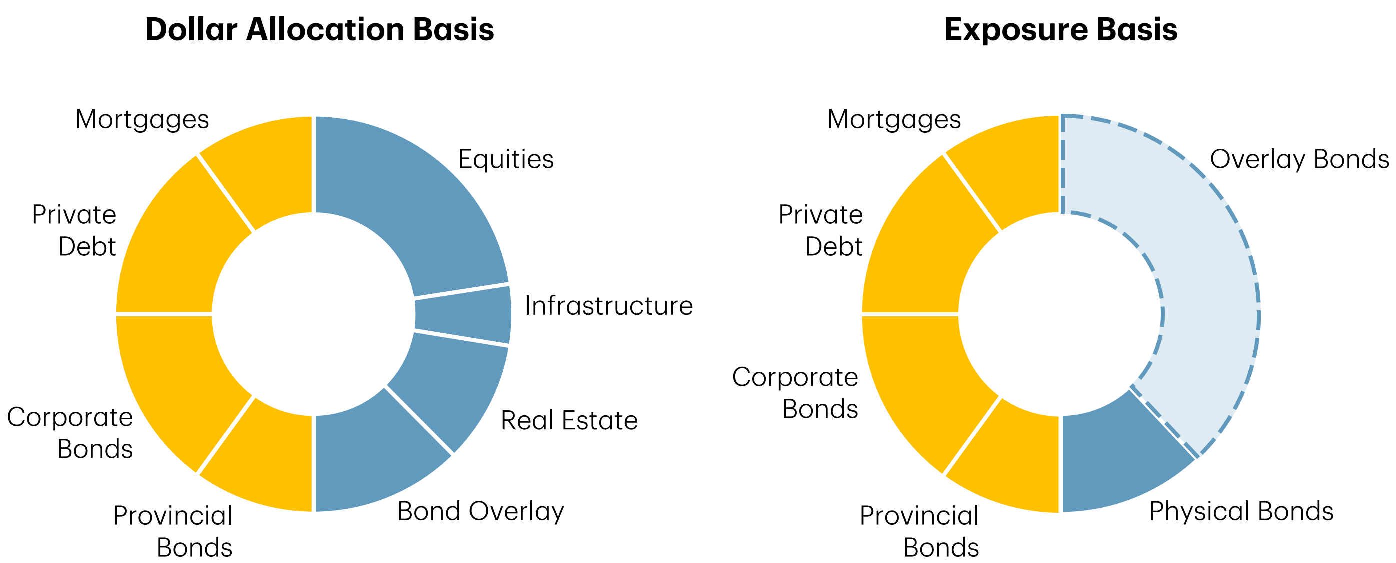
As discussed, investment horizon is a key consideration when thinking about how much risk a plan should hedge. Minimizing short-term risk typically requires a larger allocation to cash-flow-generating fixed income instruments. However, plan affordability over the long term requires exposure to growth assets. Assuming it is well diversified, the growth asset allocation is generally rewarded with a higher expected rate of return.

When the opportunity set is constrained to physical instruments, the risk/reward trade-offs can require difficult choices. Fortunately, expanding the opportunity set and using leverage as a risk reduction tool allows a plan sponsor to hedge liability risks while at the same time seeking to achieve its growth objectives.

Bond Overlay as a Risk Reduction Tool

An overlay strategy uses derivative instruments or leverage to gain portfolio exposures beyond those provided by the underlying physical investment portfolio. In this way capital is freed up for redeployment into growth assets such as equities or real asset strategies.

Figure 5:
Setting the target Hedge Ratio with cash flow generation and liability-aware growth assets



Source: TD Asset Management Inc.

On the left-hand side of Figure 5, the dollar allocation of assets is to both fixed income and growth assets. However, on the right-hand side, when viewed on an exposure basis, the bond overlay allocation is levered to provide fixed income exposure to cover the total portfolio. As a result, the bond overlay provides the sponsor the flexibility to achieve a degree of liability hedging that is not constrained by the dollar allocation to fixed income assets. Used in this way, a bond overlay can make the growth assets more liability aware.

Risk/Reward

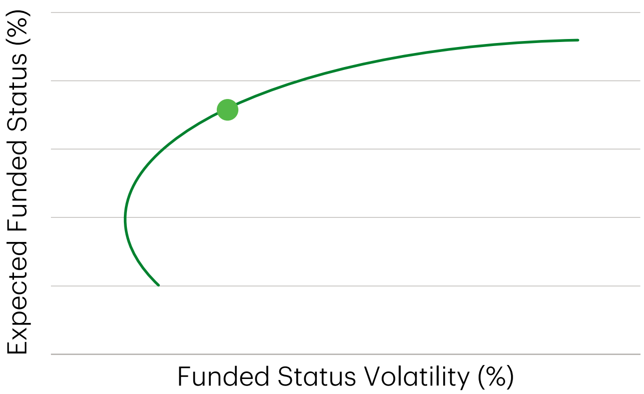
Right-Risking Properties of Equities and Alternative Assets

When investors aiming to enhance returns rely solely on increasing their equity allocation, they may not be able to do so without increasing their risk budget. However, with the application of complementary equity management styles and the inclusion of alternative assets, a portfolio's expected return may be increased while its total risk profile is reduced. This is due to the lower correlation between complementary equity management styles and alternative assets.

Furthermore, return seeking assets themselves often have liability hedging properties. For example, equities exhibit positive correlation with credit markets and thus provide a degree of liability credit hedging. Similarly, real estate and infrastructure provide a degree of longer-term inflation protection and can as a result support liability inflation hedging. That is why we prefer to refer to these assets as liability-aware growth assets. And this is why their inclusion may reduce risk relative to the plan's underlying liabilities.

For this reason, a credit hedge may not need to be 100% if the plan also has an allocation to equities. Likewise, an inflation hedge may not need to be 100% if it has an allocation to real estate or infrastructure. The reality is that many growth assets are going to have a degree of liability hedging or liability correlation, so it is beneficial to understand these liability hedging properties when establishing target hedging ratios.

Figure 6: Establishing target Hedging Ratios helps make better risk/reward trade-offs



Source: TD Asset Management Inc.

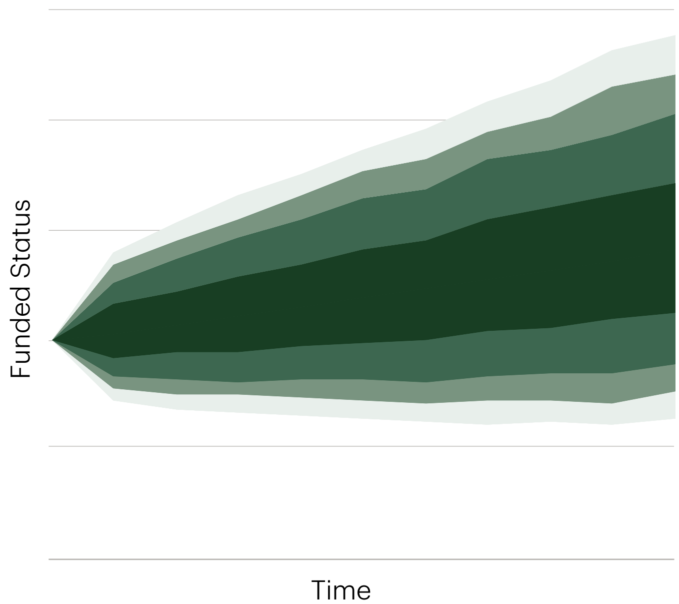
When thinking about structuring the most appropriate growth asset allocation, it is important to remember that the optimization exercise is simply a tool to better understand risk/reward trade-offs based on a set of assumptions. What is critical is that the analysis is accompanied by a deep understanding of the plan's demographics, liquidity needs, degree of cash flow matching, time horizon, liability bases and glide path considerations. When this fully integrated approach is taken, the target hedging objectives can be properly aligned with the strategic asset allocation decision.

Putting It All Together

Testing the proposed hedging strategy is essential. Plan sponsors will want to gain a degree of comfort not only with long-term expected outcomes, but also with the potential for short-term downside tail risks. This requires considering path-dependent sequencing risk, where returns in certain periods are more important than others.

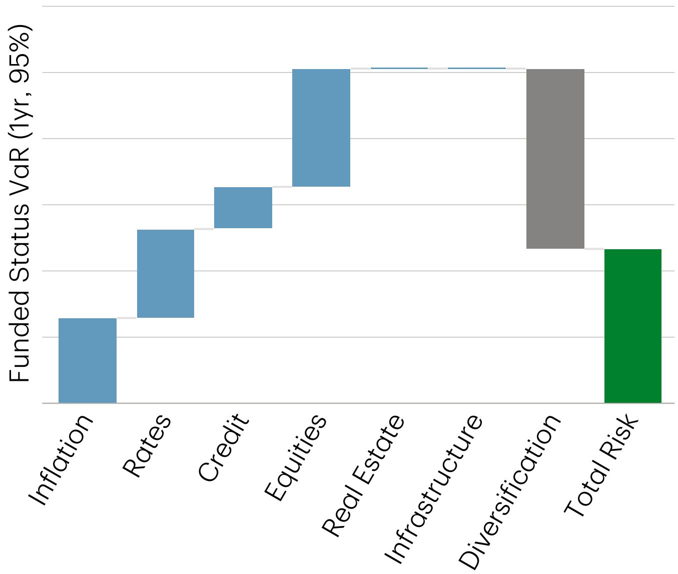
The dark green section of the tulip chart in Figure 7 illustrates the most likely long-term funded status outcomes that could emerge from a specific hedging strategy. However, the progressively lighter green sections of the projection results are also important as they point to the dispersion of expected outcomes and tail risks.

Figure 7:
Projected Funded Status Volatility



Source: TD Asset Management Inc.

Figure 8:
Funded Status Value-at-Risk (VaR) - 1 year, 95%



Source: TD Asset Management Inc.

Decomposing downside tail risks can also provide valuable insight into the drivers of risk associated with different degrees of hedging. In Figure 8, the plan's Funded Status Value-at-Risk is represented by the green bar. This is the minimum amount by which the plan's funded status could be expected to decline under a 1-in-20-year adverse event. The blue bars decompose that risk into the contributing risk factors. The grey bar shows the aggregate risk reduction due to the diversification effects and liability correlation characteristics of the various assets selected from the opportunity set.

Target hedge ratio testing and selecting the appropriate amount of risk to hedge should be based on holistic, internally consistent and realistic scenario analysis. With such a clear sightline to the key drivers of risk, plan sponsors can enjoy a greater sense of confidence that any proposed hedging strategy will meet their expectations.

The result will be a better control of the plan.

Confidence

Right-Risking

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