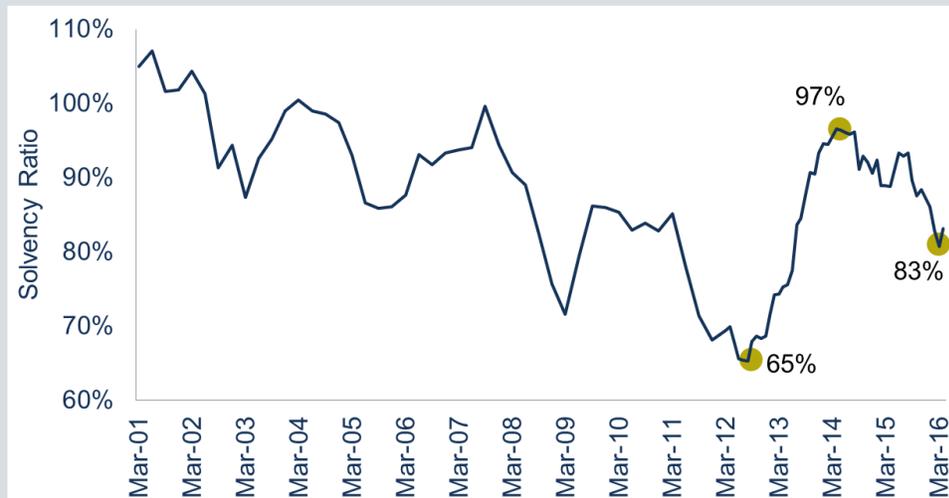


Investment Strategies 2016

Practical De-Risking Solutions: Reducing Funded Status Volatility with Absolute Return Strategies

The funded status of Canadian defined benefit (DB) plans has improved over the past three years, following a long period marked by significant volatility and growing deficits. Though somewhat tempered, volatility persists and many DB plans are now taking the opportunity to de-risk portfolios and reduce the potential for dramatic swings in future funded status.

Figure 1: Median Solvency Ratio of Canadian Pension Plans



Source: Aon Hewitt

Historically, the majority of funded status volatility in traditional portfolios has come from exposure to return-seeking assets. As a result, plan sponsors and investment committee members seeking to de-risk often face the dual challenge of reducing overall volatility while maintaining the growth profile necessary to achieve their objectives.

Previous papers in this de-risking series have considered various approaches to this challenge, such as employing low volatility equity strategies and reducing interest rate mismatch risk.¹ In this paper, we illustrate how including absolute return strategies within the return-seeking allocation in a DB plan's portfolio can be an effective approach to reducing funded status risk. By reducing funded status volatility, a plan sponsor can mitigate the risk of large declines in the

¹ For a detailed discussion of these approaches, please see our papers *Practical De-Risking Solutions: Low Volatility Equity Strategies* and *Practical De-Risking Solutions: Asset Duration and Interest Rate Risk*.

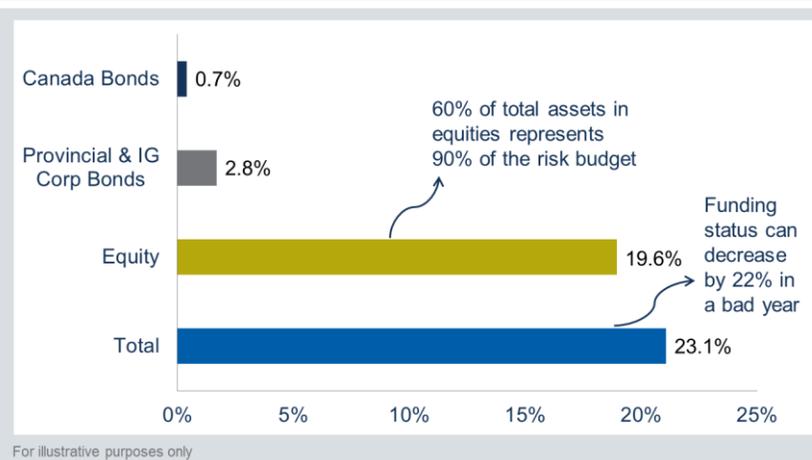
solvency position of their plan, while largely preserving the asset portfolio's overall growth profile.

Sources of Risk in DB Portfolios

One measure of downside risk in DB plan portfolios is the probability that assets will underperform liabilities; the persistent underperformance of assets versus liabilities can jeopardize a plan's ability to fund future benefit payments. As a result, plan sponsors and committee members typically have a "risk budget" in place that imposes limits on how much risk their portfolios can tolerate, and determines how that risk is allocated by asset class.

Figure 2 breaks down the sources of downside risk in a typical DB portfolio. For a typical portfolio profile such as this one, equities represent 90% of the risk budget despite making up only 60% of the portfolio's market value. This relationship is not surprising, as equity returns tend to be more volatile than other asset classes that make up the asset mix, and they exhibit

Figure 2: Traditional DB Portfolio Asset/Liability Risk Budget



very little short-term correlation to the value of liabilities in a DB pension portfolio, thus creating a mismatch. The market correction of 2008 provided a painful example of the headwinds this mismatch can create: in this environment, a typical plan with a meaningful equity allocation experienced a decline in asset values due to the equity sell-off, while concurrently experiencing an increase in the economic value of their liabilities as interest rates fell (given their sensitivity to changes in interest rates). Not surprisingly, this alignment of declining values of return-seeking assets with increasing values of interest-rate-sensitive matching assets caused the liability funding levels of many Canadian pension plans to drop by as much as 30% in the space of just 15 months.²

This notwithstanding, completely eliminating risk from return-seeking assets is not economically feasible for most DB plans, as prevailing fixed income yields are unlikely to cover potential growth in future plan costs. It is, however, possible to diversify risk within the return-seeking allocation of the portfolio in order to improve the downside risk profile of the assets. In the following section, we will examine how absolute return strategies can be effective in accomplishing this objective.

² Aon Hewitt, Median Solvency Ratio Survey, 2015.

Absolute Return Strategies

Absolute return strategies aim to produce positive returns even in volatile, flat, or falling market environments, and can provide an attractive complement to equities, which have traditionally fulfilled a return-seeking rather than liability-matching role in DB portfolios.

While return objectives and risk expectations among absolute return strategies vary widely, we have focused our analysis on a more conservative subset of absolute return strategies, represented by the HFRX Absolute Return Index, an index commonly used to represent a diversified allocation to absolute return strategies.

What separates these strategies from traditional growth assets is that they employ alternative approaches to investing that are less constrained, and have a greater range of tools at their disposal to enhance returns. Such strategies include short selling and market hedging in order to reduce volatility and to potentially benefit during periods when markets decline.

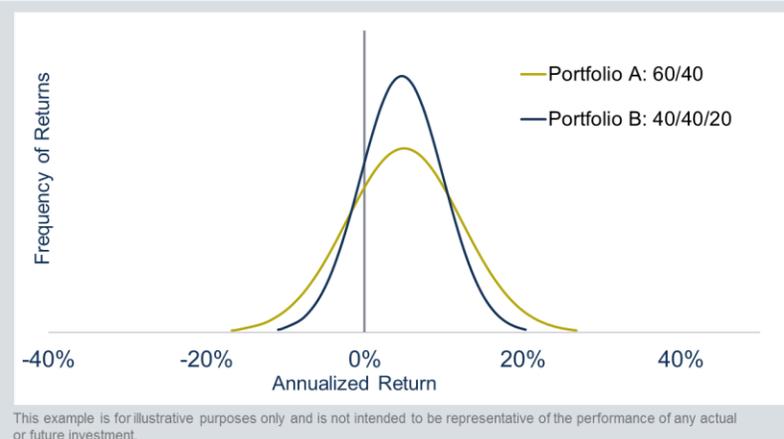
Compared to traditional, long-only equity strategies, absolute return strategies tend to have lower expected returns and considerably less expected volatility. Further, their correlation with traditional return-seeking asset classes is low – that is to say, they tend to move up and down at slightly different times. Combined, these characteristics can provide a powerful tool to mitigate overall volatility in DB portfolios and thus contribute to lower levels of funded status volatility, while substantially maintaining growth potential.

Effect on Performance in an Asset-Only Context

To illustrate this point, we used the distribution of returns for a return-seeking portfolio with and without an allocation to absolute return strategies, as shown in Figure 3. This chart demonstrates the distribution of returns for two portfolios between 1998 and 2015: Portfolio A, which is a traditional 60/40 stocks/bonds mix, and Portfolio B, which is a 40/40/20 mix of

stocks/bonds/absolute return strategies.³ The two portfolios are closely aligned at their peak, which suggests that their returns over the period were most frequently similar; however, the range of outcomes generated by Portfolio A is considerably broader, particularly in terms of drawdown potential, meaning that Portfolio A exhibits a profile that is more volatile in nature.

Figure 3: Traditional and Absolute Return Strategy Distributions



³ Equity allocation is made up of 30% S&P/TSX Composite Index (CAD) and 70% MSCI World Index (USD), fixed income allocation is made up of FTSE TMX Canada Universe Bond Index (CAD), and absolute return strategy allocation is made up of HFRX Absolute Return Index (USD). These proxies apply to all examples of Portfolio A and B throughout the paper.

Figure 4 summarizes the volatility and drawdown qualities of these portfolios. In addition to the difference in drawdown, Portfolio B also experienced markedly less volatility than Portfolio A, with comparable returns. This translates to a more efficient portfolio, which is quantified by the Sharpe ratio, a measure of risk-adjusted returns.

It is important to note that this improved efficiency results from reduced volatility and drawdown rather than higher returns relative to equities. Figure 5 uses the same model

portfolios to compare their historical performance during three recent meaningful down markets. As demonstrated in the chart, Portfolio B experienced lower overall drawdowns during all three periods.

Effect on Performance Relative to Liabilities

The previous section highlights the effect absolute return strategies can have on a portfolio in an asset-only context, but does not address the issue of performance relative to liabilities.

To explore the effect absolute return strategies can have on performance relative to liabilities, we measured the funded status volatility of a liability portfolio against the two asset portfolios used previously: Portfolio A, with its traditional 60/40 mix, and Portfolio B, with 20% of its equity allocation reallocated to absolute return strategies. Our

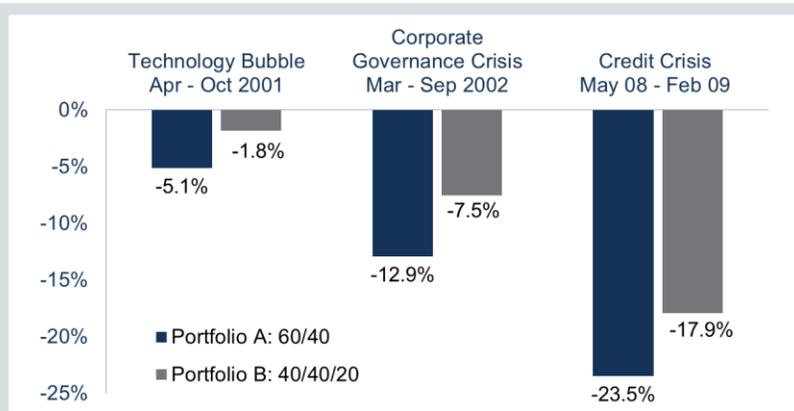
forward-looking analysis, as shown in Figure 6, illustrates the projected funded ratios for a plan

Figure 4: Traditional and Absolute Return Strategy Sample Portfolios

	Portfolio A: 60/40	Portfolio B: 40/40/20
Maximum Drawdown	-24.2%	-17.9%
Annualized Volatility	7.3%	5.2%
Mean Return	5.0%	4.7%
Sharpe Ratio	0.36	0.45

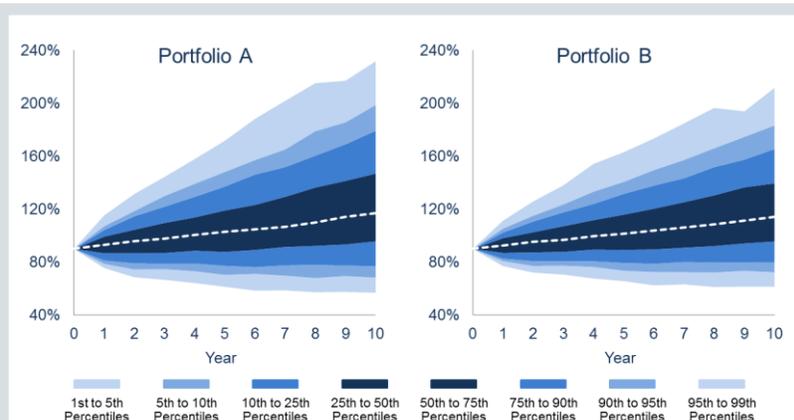
Source: FTSE TMX Global Debt Capital Markets Inc. This example is for illustrative purposes only and is not intended to be representative of the performance of any actual or future investment.

Figure 5: Portfolio Performance in Down Markets



Source: FTSE TMX Global Debt Capital Markets Inc. This example is for illustrative purposes only and is not intended to be representative of the performance of any actual or future investment.

Figure 6: Projected Funded Ratios



Source: PH&N IM. This example is for illustrative purposes only.

investing in portfolios A and B over a 10-year period. Relative to Portfolio A, Portfolio B exhibits a much narrower range of funded ratios, which suggests that this portfolio would experience lower funded ratio volatility and drawdown risk over this time horizon.

Effect on Funded Status

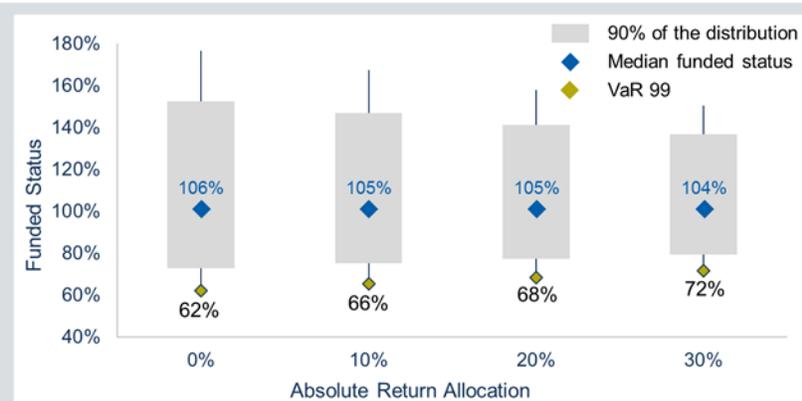
It goes without saying that equities are a source of upside potential as well as downside risk. Absolute return strategies tend to forgo some of that upside potential in exchange for downside protection – but to what degree? Figure 7 shows the funded status distribution of a portfolio with varying exposure to absolute return strategies over a 10-year period. Each column represents 90% of the potential funded status distribution of that portfolio, with the bottom of each column representing the worst outcome likely with 95% confidence, and the top of each column representing the best outcome likely with 95% confidence.⁴

The chart shows that absolute return strategies decrease the downside of funded status at the expense of some upside, and this effect increases as the allocation to absolute return strategies grows.

Considering the circumstances in which these best- and worst-case scenarios are likely to occur provides important further

context. The best-case scenario is likely to occur when markets are in a period of very strong performance and the pension plan benefits as a result. In this scenario, contributions may be able to be reduced due to the strong position of the plan. The worst-case scenario, on the other hand, is likely to occur as a result of a large drawdown event during a period of prolonged market stress. In this scenario, businesses may also be doing poorly, which means that plan sponsors would be tasked with topping up their pension plans during what would likely be a challenging period. We believe that the negative impact resulting from the latter case is significantly more pronounced than the benefit resulting from the former, and as a consequence, find this a compelling argument in favour of absolute return strategies.

Figure 7: Funded Status Distribution



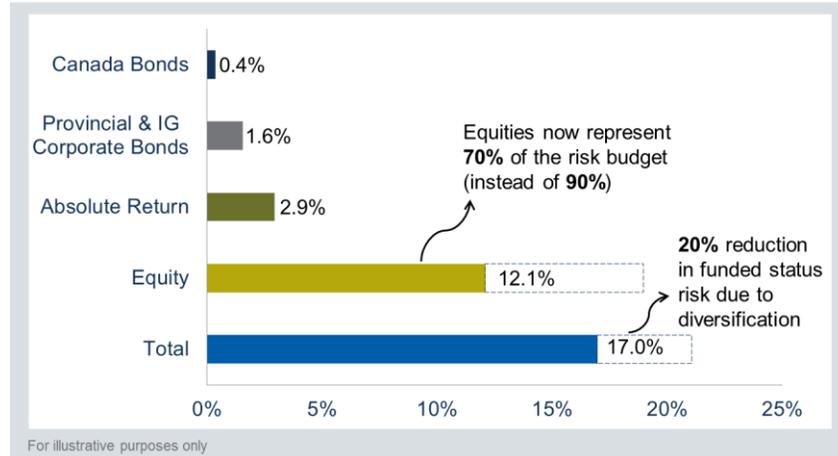
Source: PH&N IM Allocation to absolute return strategies sourced from equities
 Note: VaR 99 represents the worst outcome likely with 99% confidence.
 This example is for illustrative purposes only

⁴ For more details on modelling methodology and assumptions, please see the appendix.

Effect on Risk Budget

In Figure 1, we illustrated a traditional DB plan's asset/liability risk budget in terms of a downside market scenario in which a 60% allocation to equities represented 90% of the total risk budget. In Figure 8, we illustrate how adding absolute return strategies to this portfolio can impact the sources of and expectations for declines in funded status.

Figure 8: Alternative DB Portfolio Asset/Liability Risk Budget



The addition of a 20% allocation to absolute return solutions, funded from equities reduces total funded status risk by 20%, from 22% to 17%. This material reduction in potential losses can have a meaningful impact on a plan sponsor's obligations and risk during significant market deterioration. This is an important result for

institutional investors who are sensitive to any decreases in funded status but want to retain some growth potential beyond bonds within their portfolios.

Investor Considerations

There are a number of issues that institutional investors who are contemplating the inclusion of an allocation to absolute return strategies in a portfolio should consider. These include, but are not limited to:

- **Implementation Options.** This paper focused on the potential for an allocation to absolute return strategies within the context of a return seeking portfolio. However, such an allocation can also be made through a portable alpha or overlay program as part of a liability-driven structure or in a return seeking portfolio. Therefore, investors should consider their overall objectives and risk tolerance to ensure the most appropriate implementation methodology and portfolio structure.
- **Increased Complexity.** Absolute return strategies may introduce additional complexity to investment portfolios due to the nature of the non-traditional tools they often employ (such as derivatives and shorting), as well as a substantially different risk and return profile relative to traditional investments. It is important to recognize and understand the more nuanced nature of these strategies in order to properly and effectively implement them in portfolios.
- **Governance Requirements.** Governance policies and procedures should reflect and address the unique characteristics and investment tools employed by absolute return strategies to ensure full compliance with investors' existing policies. A strong focus on

board and committee education is critical to ensure that objectives and expectations are appropriately understood and established.

- **Oversight.** Given the additional complexity associated with absolute return strategies, it is important to have an appropriate oversight process in place to ensure that these strategies operate within their stated mandates and risk limits. Effective oversight should include regular reporting, periodic due diligence, and transparent communication.
- **Costs.** Absolute return strategies may come with higher fees relative to traditional investments, reflecting specialized knowledge and expertise as well as potential capacity constraints associated with these strategies.

Conclusion

While the current funded status of many Canadian pension plans is significantly improved compared to the deficits suffered over the past decade, funded status volatility remains a primary concern. As a result, it has become increasingly important for plan sponsors to focus on reducing volatility going forward in order to support their long-term objectives. This aim presents its own challenges, however, as a meaningful reduction in risk may often be accompanied by a reduction in returns as allocations to growth assets are diminished.

An allocation to absolute return strategies can help reduce funded status volatility without significantly impacting the portfolio's growth profile. Furthermore, these strategies tend to improve a portfolio's risk-adjusted returns and its consistency of returns while diminishing large drawdown events. Consequently, we find that absolute return strategies present a compelling solution to a challenge faced by many pension plans today.

For additional details, please contact your PH&N IM institutional portfolio manager,
or call 1-855-408-6111 or email institutions@phn.com

Appendix

Figure 6 and 7 Modelling Methodology and Assumptions

The columns depicted in figures 6 and 7 represent 90% of the funded status distribution of each portfolio, with the bottom of each column representing the 5th percentile funded status (the worst outcome likely with 95% confidence), and the top of each column representing the 95th percentile funded status (the best outcome likely with 95% confidence).

The modelling methodology used was a Monte Carlo simulation, running 1,000 repetitions of 10 years of annual returns on respective portfolios. Return, standard deviation, and correlation assumptions for the various asset classes are shown in Figure 9 below.

Figure 9: Capital Market Assumptions

	Annualized Return	Standard Deviation	Correlation			
			Liabilities	Fixed Income	Equities	Absolute Return Strategies
Liabilities	2.45%	8.0%	1	0.997	0.196	0.128
Fixed Income	2.75%	7.5%	0.997	1	0.225	0.159
Equities	7.00%	14.0%	0.196	0.225	1	0.596
Absolute Return Strategies	6.00%	6.0%	0.128	0.159	0.596	1

Source: PH&N IM

Expected returns are RBC GAM's best estimate, forward-looking views. Standard deviations and correlations are estimated from historical data over the period January 1990 to December 2014. This analysis is for illustrative purposes only and not a guarantee of future returns or risk.

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