

## DYNAMIC RISK MANAGEMENT

Over the past decade, when it comes to managing risk associated with the policy asset mix, plan sponsors of defined benefit (DB) plans have experienced the volatility but without the reward. As a result, there has been a material deterioration in the financial position of DB plans. This article looks at alternative approaches to help manage risk and that aim to address the shortcomings of the traditional risk management approach.

### BREAKING WITH TRADITION

Under a traditional approach to risk management, the policy asset mix is established along with rebalancing parameters around the mix. The policy asset mix is periodically reviewed, but most committees make little or no changes to the policy. The traditional approach to managing risk is effective when markets are trending. A shortcoming of the traditional approach is when equity markets experience significant market declines. Unfortunately such instances happen more often than investors typically expect (see appendix for research) which has contributed to the decline in the financial position of DB plans.

An alternative, more dynamic approach to managing risk is based on predetermined trigger points and can improve a plan's ability to limit the impact of significant market declines. A dynamic approach recognizes that the level of risk varies over time in response to market changes. Therefore, the asset mix is adjusted to reflect the changing risk and return experience. A dynamic approach is most effective when it takes into account both the investments and the "risk and return" associated with the change in value of the liabilities, such as the funded ratio measure.

### TRADITIONAL VS. DYNAMIC

A DB plan with 60% equities and 40% long bonds was analyzed to illustrate the impact to the funded ratio using both traditional and dynamic approaches to managing risk. To capture a range of market experiences, the analysis reviewed the period 1 January, 1998 through to 31 March, 2012. The returns of the DEX Long Bond Index were used as a proxy for the changes in the DB plan liabilities. The starting funded position was 90%. The illustrations do not allow for any actuarial smoothing nor do they recognize contributions that would be required if the funded position deteriorates to certain levels. The goal is to instead capture the economic impact of market volatility to the asset and liability values.

The chart below shows the change in the funded position for the traditional approach which maintained a 60% equity and 40% fixed income allocation through quarterly rebalancing. The funded ratio climbed as high as 111%, but by the end of March 2012 was only 68%.



Source: Thomson Reuters Datastream and Connor, Clark & Lunn Financial Group

The predetermined rules to trigger changes in the asset mix of a dynamic approach are as follows:

- If the funded ratio improves by 3% or more over a quarter, switch 3% out of equities into long bonds;
- If the funded ratio worsens by 3% or more over a quarter, switch 1.5% out of long bonds into equities; and
- For changes of less than 3% in the funded ratio, no changes to the asset mix.

The above rules are referred to as a two-way dynamic approach and recognize that investors need to be willing to change the asset mix in good times and in bad. There is a smaller asset mix shift when the funded position worsens since the reduction is often associated with declining and more volatile equity markets. A smaller shift avoids accidentally increasing the desired risk level when making asset mix changes.

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The chart below shows the change in the funded position for both the traditional and the two-way dynamic approach. The dynamic approach fares better than the traditional approach, but the plan was only 78% funded by the end of March 2012.



Source: Thomson Reuters Datastream and Connor, Clark & Lunn Financial Group

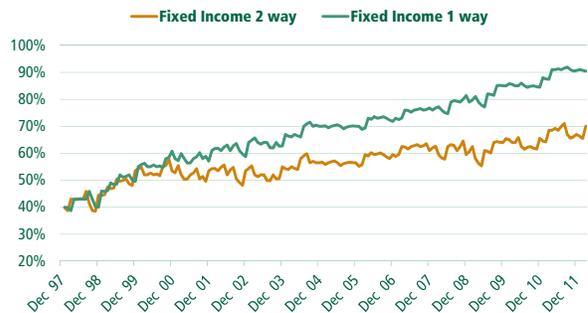
Another dynamic example, referred to as a one-way dynamic approach, is where an asset mix change is made only when the funded ratio improves. In the example below, 3% is switched out of equities into long bonds when the funded ratio improves by 3% or more during a quarter. This approach is utilized by plan sponsors who have made the decision to de-risk and want to adopt a formal process to reduce risk.



Source: Thomson Reuters Datastream and Connor, Clark & Lunn Financial Group

The chart highlights that the one-way dynamic approach fares the best out of all three approaches as the plan is 84% funded at the end of March 2012. But should this be a surprise? The best performing asset class for the period January 1, 1998 through to March 31, 2012 was long bonds with a return of almost 8% per annum. Canadian equities achieved the next best return with a return close to 7% per annum, while the combined US and international equity return was around 2% per annum. Given this background, both dynamic approaches performed reasonably well. It also explains why the one-way dynamic approach performed best for the period highlighted.

Under a dynamic approach, the asset mix evolves to reflect changes in market conditions as highlighted in the chart below. Under the two-way approach, the fixed income component started at 40% of assets, and then climbed up to 60% of assets before the technology bubble burst in 2001. It gradually declined to below 50% during 2002 and then climbed to settle below 70% of total assets by the end of March 2012. In contrast, the one-way approach has steadily climbed up to 90% of assets by the end of March 2012.



Source: Thomson Reuters Datastream and Connor, Clark & Lunn Financial Group

## PAST INFLUENCES

A major contribution to the financial difficulties that many plan sponsors are in with respect to their DB plans is due to the outperformance of long-term bonds compared to equities. Has this experience also influenced the different risk management approaches? For example, under more “normal” market cycles where equities are expected to outperform most other asset classes, including bonds, will the dynamic approach still be as effective?

Using the same period as in the previous examples but making adjustments so that long-term bonds achieved half their actual return and the combined equity return was higher than that of bonds, it appears there is still some merit to considering a dynamic approach to risk management. However, the biggest difference under the “adjusted return” scenario was that all of the approaches would have been over 100% funded at the end of March 2012, since there was no longer a material impact to the funded position caused by the liabilities growing faster than the assets. The dynamic approaches still performed slightly better than the traditional approach since they tended to have less exposure to equities compared to the traditional approach around the time of significant equity market declines. The predetermined trigger points under the dynamic approaches meant that the equity exposure was lower since the asset mix adapted to the changing market conditions.



## KEY TAKEAWAYS

When it comes to asset mix risk management, plan sponsors should at least consider the merits of adopting a dynamic approach. This recognizes that:

1. Risk management should take into account the true economic experience of both the assets and liabilities.
2. Risk levels vary in response to changes in the markets.
3. A dynamic approach responds to market changes and can help protect against downside or tail risks, which happen more often than expected.
4. A dynamic approach can provide a discipline to managing risk whether long-term interest rates are rising or declining. This is better than the indecision that has historically plagued many pension committees.

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## APPENDIX – MARKET RETURN DISTRIBUTION ANALYSIS

Under statistical modelling, market returns are often assumed to follow a standard bell curve. Yet, comparing the expected range of monthly returns for the Canadian and US equity markets (represented by the S&P/TSX Composite and S&P 500 Index local returns) suggests that market crashes are more regular than many investors expect.

Our research compared actual monthly returns for the 40-year period ending September 30, 2011. Returns were segmented into “return bins” that represented 1, 2 and 3 standard deviations from the average monthly return. The same analysis was modelled assuming a bell curve distribution based on the historical average return and volatility.



The chart to the left shows the net percentage difference in the frequencies of the actual and expected observations for each of the return bins (i.e., 1, 2 and 3 standard deviation occurrences). In other words, had the number of actual occurrences been the same as expected, the net percentage would have been zero. If the number of occurrences were double what had been expected, the net percentage would have been 100%. A positive percentage implies there were more occurrences than expected, while a negative percentage implies there were fewer occurrences than expected.

The chart highlights the historical tail risk where large negative returns occurred more frequently than expected for both the Canadian and US equity markets. There were also fewer strong positive return occurrences than expected.

Source: Thomson Reuters Datastream and Connor, Clark & Lunn Financial Group