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MANAGING INVESTMENTS IN A MARKET CONSISTENT FRAMEWORK

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Market Consistent Embedded Value (MCEV) is the present value of the future shareholder transfers determined on a risk adjusted basis. It is also the market value of assets less the market value of liabilities, where the market value of liabilities is determined on a risk-adjusted basis. Managing a book of life insurance policies on an MCEV basis can have broad implications for product strategy, pricing and investment strategy. This article focuses on the implications and uses of MCEV in developing investment strategy.

REPLICATING PORTFOLIOS

The concept of a replicating portfolio is critical to the theoretical underpinnings of MCEV reporting and can be helpful in understanding and evaluating the impact of a particular investment strategy. A replicating portfolio is the investment portfolio that best replicates the features of the liabilities, e.g., the liability cashflows across a wide range of economic scenarios or the value of the liabilities under various financial stress tests and sensitivities.

This is not to say that the replicating portfolio, once identified, is the portfolio we should invest in. Insurers are risk-taking entities. Investing in an alternative portfolio involves taking on more economic risk (relative to the liabilities), but this can be justified as long as the expected return from taking on this risk exceeds the return required for the additional risk capital. Any excess return earned will ultimately enhance the enterprise value once the return is earned and the risk has been released.

Replicating portfolios with a very close fit to complex insurance liabilities may be difficult or impossible to construct. Achieving a close fit, particularly in the distribution tails, may require the construction of theoretical exotic, non-traded derivatives and may require the inclusion of a rebalancing. As such, the theoretical minimum risk portfolio may include assets that cannot be practically or cost-effectively secured. In that case, the best an investment manager can do to minimize investment risk is to digress from the theoretical minimum risk portfolio and acquire assets that are obtainable in deep and liquid markets—the investable replicating portfolio. Both the investable and theoretical replicating portfolios have their uses and the difference between the two can be seen as a product related risk

rather than an investment risk (as the product design forces this minimum level of mismatch).

Impact of the Liquidity Premium

The consideration of a liquidity premium in MCEV is a hotly debated topic that will likely have a significant impact on investment strategy. The recently released updated MCEV principles allow for consideration of a liquidity premium, though specific guidance on how to determine the liquidity premium is not yet prescribed.

When there is no liquidity premium, an investable risk-free position exists for fixed cashflows—either Treasuries or swaps, depending on the definition of risk-free. But if a liquidity premium is included, an equivalent investable risk-free position may or may not exist. For example, if liquidity premium is defined as long corporate bonds plus CDS protection on those names, this negative basis trade is investable. However, if the liquidity premium is defined by reference to a structural model then an investable position may not exist.

If the risk-free position is not investable, then management must make a choice between:

- investing in liquid risk-free assets and foregoing any liquidity premium, thereby locking-in a loss position, or
- investing in risky assets (potentially with some default protection) in an effort to extract a liquidity premium that approximates the liability liquidity premium, but thereby introducing exposure to credit risk.

IMPLICATIONS FOR INVESTMENT STRATEGY

If managing to MCEV, the aim is maximize MCEV earnings which are the growth in MCEV on a risk-adjusted basis. Risk can be measured by volatility in MCEV or percentile moves in MCEV, so our approach to investment management can be very similar to what many investment departments already do: measure the risk in terms of volatility or a specified percentile for the selected metric (MCEV), measure return expectations

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under the selected metric (expected MCEV earnings) for alternative investment strategies, define an efficient frontier and look for the intersection with the risk appetite.

MCEV may cause some insurers to question the purpose or value of beta. In an efficient world, the strategic asset allocation will affect the insurer's beta, which should translate directly through to cost of capital. So, value is not generated through beta since any changes to the expected return should be offset by implied changes to the cost of capital. This might imply that strategic asset allocation that focuses on managing beta is not value-adding.

Although investment strategy will not usually directly impact the initial MCEV (only pricing changes will impact the MCEV at the point of sale), investments will impact the emergence of MCEV earnings. Since changes in the economic environment directly impact MCEV it can be a volatile metric. As investment strategy impacts the emergence of earnings and is often the most significant source of MCEV earnings volatility, it can be used as a mechanism to manage that volatility by incorporating strategies designed to hedge MCEV. MCEV results can be analyzed to help make decisions on investment strategy.

As an example, the impact on MCEV of varying equity market returns, yield curves and defaults/credit spread widening can be analyzed.

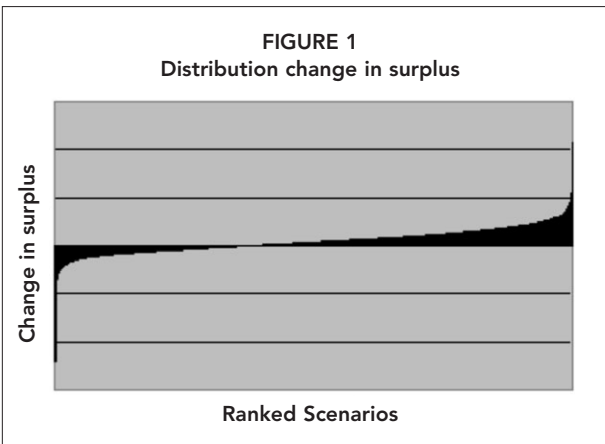


Figure 1 shows the results of these scenarios in rank order from the combination of shocks that produces the lowest surplus to that which produces the largest. In order to drill into these results we can look separately at each risk.

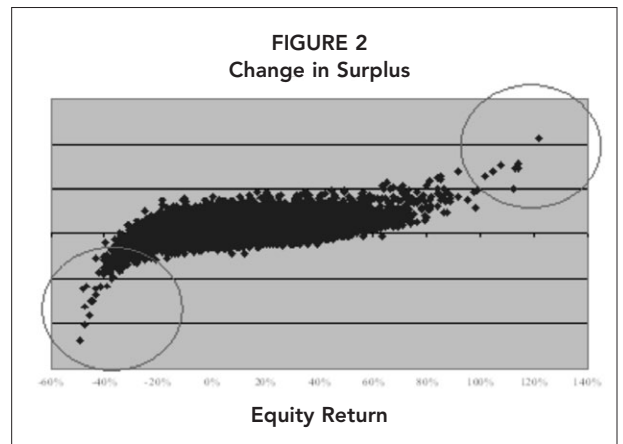


Figure 2 shows the sensitivity of results to equity shocks. It appears that this product is reasonably well-hedged within a range of equity performance, but there may be opportunity to trade off some more of the upside in the extremely high equity returns to protect against some of the downside in the extremely low (see circled results).

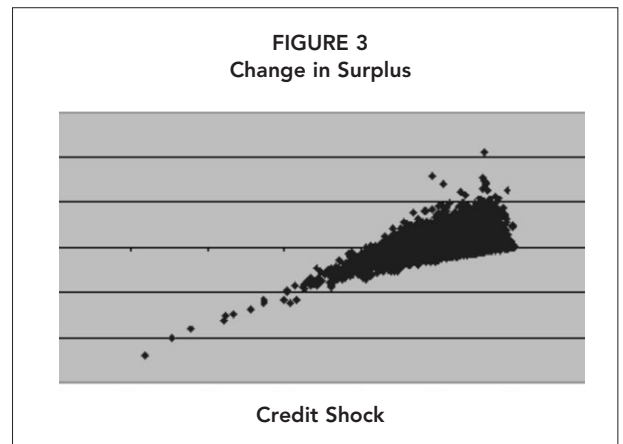
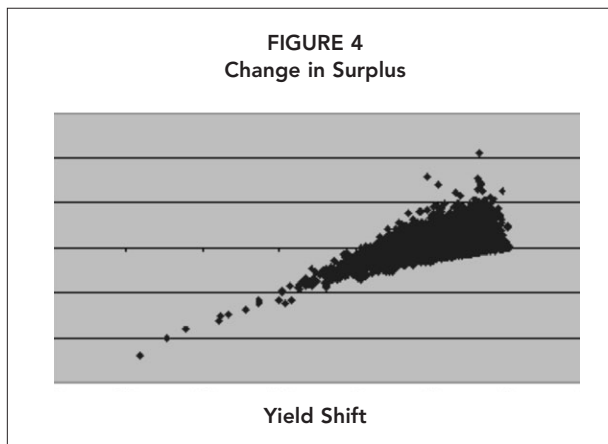


Figure 3 analyzes the impact of credit shocks. It shows that this product is basically unhedged with respect to credit risk. Negative credit shocks produce negative results and positive shocks produce positive results.

// MCEV (MARKET CONSISTENT EMBEDDED VALUE) CAN BE A VALUABLE METRIC IN MONITORING AND UNDERSTANDING THE RISKS TO WHICH AN INSURER IS EXPOSED. //

Finally, Figure 4 summarizes the impact of yield curve shifts. This shows a reasonably well hedged position since there is not a discernable slope to a regression line. Variances in positive and negative results appear to be independent of yield curve shifts.



When reviewing these results in total, potential modifications to investment strategy that could reduce the risk exposure might include:

- To hedge the equity exposure, if an adequate market exists, an investor could sell equity market call options with a high strike price so any payments due under the call option would be offset by the positive MCEV earnings currently seen in Figure 2. The proceeds could be used to buy out-of-the-money put options to protect the extreme downside risk.
- To hedge the credit exposure seen in Figure 3, if an adequate market exists, credit protection could be bought and sold in order to hedge some of the extreme aspects of this position and stabilize results. However, perfect hedges of credit risk are unlikely to be available due to the depth of the market and the exposure to counterparty risk. Reducing the credit exposure seen in Figure 3 would reduce volatility, but may also decrease the ultimate expected returns—unnecessarily to the


extent management believe this risk can be effectively managed.

- While the exposure to yield curve shifts appears reasonably well-hedged, there may be a slight negative slope to a regression line in Figure 4, indicating an opportunity to trade off the positive impact of negative interest rate movements to cover the negative impact of positive shifts (e.g., using interest rate swaps). However, this would not be a priority based on the magnitude of exposures to equity and credit risks.

These actions or some combination thereof, should give more stability to MCEV earnings and may make sense if management was uncomfortable with the distribution summarized in Figure 1.

CONCLUSION

There are many other implications of managing to MCEV—including implications for performance measurement and investor communications. Strategic asset allocation and decisions to deviate from the replicating portfolio imply taking on various levels of risk and will impact the emergence of MCEV earnings. In some cases, there will be opportunities to manage volatility in this metric. Complicating matters are issues such as liquidity premium that are still being debated.

Nonetheless, MCEV can be a valuable metric in monitoring and understanding the risks to which an insurer is exposed. When properly utilized and determined, MCEV can provide a basis to articulate and disclose the risks as well as a clearer line of sight to the role of the investment actuary in managing these risks. 



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