



The Milliman Hedge Cost Index™ (MHCI) provides the estimated hedging cost for a hypothetical Lifetime Guaranteed Minimum Withdrawal Benefit (Lifetime GMWB) block based on product specifications and modeling assumptions as described below. The expected hedge costs are calculated using product features for a generic Lifetime GMWB in line with product designs common in the market. Likewise, the modeling assumptions are based on typical actuarial and behavioral assumptions widely used by Variable Annuity (VA) writers in the marketplace.

KEY PRODUCT FEATURES

Fund volatility

Volatility management strategies have gained popularity in the VA marketplace, providing effective risk management within the funds and reducing the cost of hedging. This in turn is allowing companies to pass the cost savings to their customers via lower product charges and/or richer benefits. The MHCI is calculated assuming a target fund volatility of 10%.

GMWB rider fee and other charges

The MHCI is based on a rider fee assumptions of 115 bps of the guaranteed withdrawal base (GWB), in line with current fee levels observed in the market. In addition, the MHCI assumes 2.25% of account value for the combined total of mortality and expense (M&E) fees and investment fees.

Lifetime withdrawal rate

Prevailing designs in the marketplace typically vary withdrawal percentage by the age at the first withdrawal. Accordingly, the MHCI is based on age-banded lifetime withdrawal rates as follows:

AGE AT FIRST WITHDRAWAL	W/D RATE
<65	4.00%
65-74	5.00%
>74	6.00%

Bonus

The GMWB product includes an annual compound interest 5% bonus. The bonus amount is calculated as 5% of the previous year's GWB. The bonus benefit is available for up to 10 years while policyholders are not withdrawing.

Resets

The GMWB product includes an annual reset for the greater of 10 years from issue or age 80. The GWB may step up to the account value on the policy anniversary if the account value is greater than the GWB.

KEY MODELING ASSUMPTIONS

The MHCI is calculated using modeling assumptions for actuarial and policyholder behavior in line with standard industry practice.

Lapse rate

Milliman uses data from industry surveys of base lapse assumptions for a B-Share product. In addition to the base lapse assumption, the dynamic lapse function will reduce lapses when the guarantee is in-the-money and will increase lapses when the guarantee is out-of-the-money.

Withdrawal utilization

In practice, a GMWB policyholder decides when to start withdrawing. For modeling purposes, it is assumed that a percentage of policyholders will withdraw immediately and others will wait for a few years before taking out any GMWB payment. In addition, it is assumed that a small percentage will never withdraw.

Mortality

The mortality assumption is based on an industry standard mortality table with future mortality improvement modeled using a standard age-based projection scale. The index assumes a 50/50 split between male and female policyholders.

Projection period

The projection continues until the end of the mortality table.

Interest rates

MHCI calculations are based on end-of-month U.S. swap interest rates.

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APPENDIX: METHODOLOGY CHANGES

Milliman conducts annual reviews of the product features and assumptions underlying the Milliman Hedge Cost Index and will implement updates to the assumptions as and when appropriate to keep pace with market trends and industry practice.

CHANGES EFFECTIVE JUNE 2015

Product assumptions

- Most VA writers offer a bonus (or “roll up”) feature in which a pre-defined bonus will be added to the benefit base if a policyholder waits to withdraw the lifetime income. The bonus feature used in the MHCI has been updated from a 5% simple interest bonus to a 5% compound interest bonus, one of the most common designs in the market.
- VA writers have continued to increase the rider fees charged for VA guarantees in their new product offerings during the past few years. To reflect this trend and the change in bonus design, the GMWB rider charge has been increased from 100 bps to 115 bps.
- The M&E and investment fees used in the MHCI have been increased to align the index with fees currently charged in the marketplace. The new design assumes a 2.25% of account value for the combined total of M&E and investment fees.

Modeling assumptions

- Base lapse rates used in the MHCI have been lowered slightly based on recent industry surveys of VA pricing assumptions. Additionally, the dynamic lapse factors have been lowered for in-the-money policies and increased for out-of-the-money policies.
- The MHCI mortality assumptions have been updated to the 2012 IAM Basic table with mortality improvement modeled using Projection Scale G2. In addition, the MHCI will include no utilization of the spousal continuation option going forward to better align with current industry practice.
- The MHCI assumptions for withdrawal timing have been adjusted to reflect recent industry pricing survey results with a slightly longer average delay than the previous design.

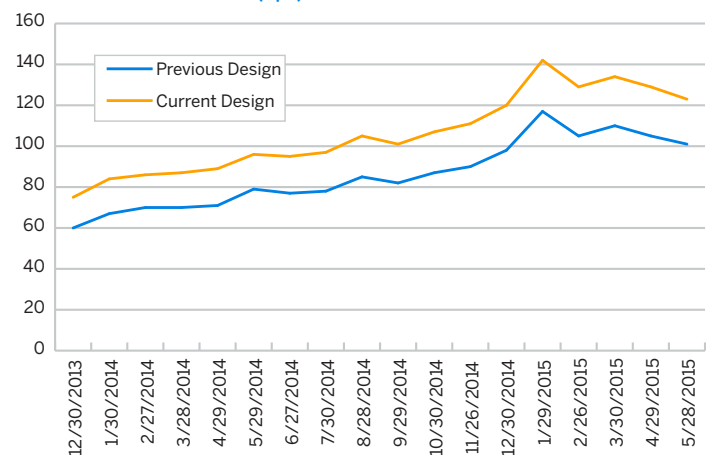
Impact analysis

The table and graph below provide historical monthly MHCI comparisons between the previous and the current bases. Since December 2013, the difference in expected hedge costs is in the range of 15 to 25 bps. The monthly changes in the new MHCI are primarily driven by movements in the swap interest rate because the index is calculated assuming a target fund volatility of 10%.

EXPECTED HEDGE COST
(bps of Guaranteed Withdrawal Base)

	PREVIOUS DESIGN	CURRENT DESIGN	CHANGE FROM PREVIOUS DESIGN
12/30/2013	60	75	15
1/30/2014	67	84	17
2/27/2014	70	86	16
3/28/2014	70	87	17
4/29/2014	71	89	18
5/29/2014	79	96	17
6/27/2014	77	95	18
7/30/2014	78	97	19
8/28/2014	85	105	20
9/29/2014	82	101	19
10/30/2014	87	107	20
11/26/2014	90	111	21
12/30/2014	98	120	22
1/29/2015	117	142	25
2/26/2015	105	129	24
3/30/2015	110	134	24
4/29/2015	105	129	24
5/28/2015	101	123	22

EXPECTED HEDGE COST (bps)



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