

Inforce Management 2014 ACHS Fall Meeting

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RETIREMENT | INVESTMENTS | INSURANCE



IMPORTANT INFORMATION

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Agenda

- Fixed Indexed Annuity (FIA) Product Basics
- FIA Valuation Example
- Inforce Management Value Creation
- Questions

What is a FIA?

- A fixed annuity with a crediting interest formula based on an external index (e.g. S&P500). For the most part, these products reside in the general account similar to other fixed annuities
- Some Potential Crediting Strategies
 - Fixed Rate
 - Point to Point Cap
 - Point to Point Participation
 - Monthly Cap Index
- Underlying Guarantees
 - Minimum Guaranteed Contract Value (MGCV) – minimum return regardless of index performance
 - May be stated as a percentage of the initial premium that grows at a guaranteed fixed interest rate. The MGCV does not affect the account value, but does affect the surrender value of the contract
 - Guaranteed minimum withdrawal benefits (GMWB)
 - Provides a guaranteed minimum payout for life typically based on age
 - Similar in nature to variable annuity GMWB features with less the equity volatility

Crediting Strategy – Point to Point Cap

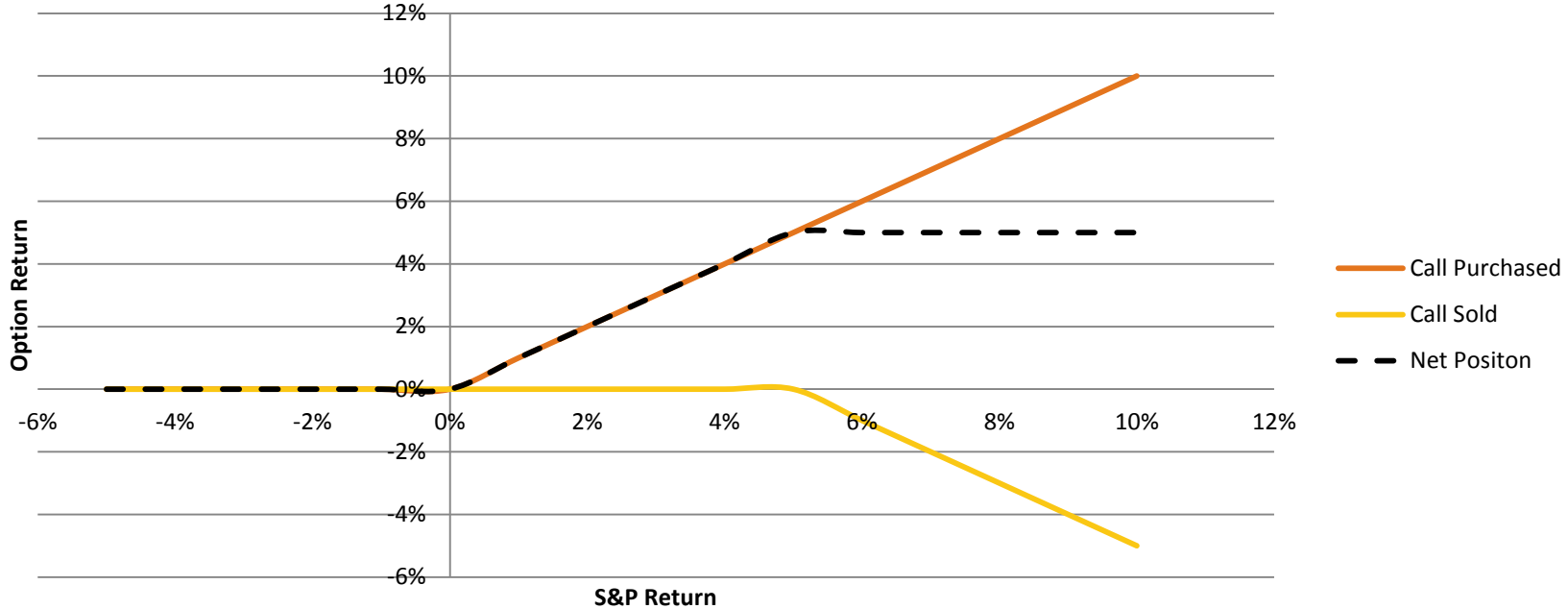
- The annual index credit is calculated as the annual point-to-point increase, if any, in the index during the contract year, up to the stated index cap, and floored at zero
 - Annual Return = Max(Min(Index Return, Index Cap), 0)
- The index cap is declared in advanced, guaranteed for one year, and may change annually

| Time | AV | Cap | S&P Return | Interest Credited |
|------|-----|-----|------------|-------------------|
| 0 | 100 | 5% | N/A | N/A |
| 1 | 105 | 5% | 7% | 5% |
| 2 | 105 | 5% | -10% | 0% |
| 3 | 107 | 5% | 1.9% | 1.9% |

Hedging

- The Index Strategy for an FIA can be replicated by a call option position
 - Purchase an at the money call
 - Sell an out of the money call @ the cap rate
 - Real life complications: timing of transactions, surrenders, other guarantees

Hedge Position for Cap Strategy (5% cap)



Investment Strategy and Hedging

- Investment Income is the primary source of income on an FIA product...there are no fees for the base product
- The basic investment strategy
 - Hedge the index guarantee by purchasing options
 - The payoff from the option may pay for the index credits owed to the policy holder (in real life there are mismatches)
 - Invest remaining funds (statutory reserve) in a bond portfolio
 - The investment income earned on the bonds may:
 - Recoup the cost of hedging
 - Pay for underlying guarantees (MGCV)
 - Pay for other expenses like commissions
 - Generate earnings
- Example:
 - $AV(0) = 100$
 - Statutory Reserves (0) = 93
 - Option Cost = 2.0
 - 4.5% earned rate (ignoring other expenses)
 - Earnings = $93 \cdot 4.5\% - 2.0 = 2.19$

Interest Crediting

- FIA credited rates (e.g. caps, participation rates) are determined at issue and each renewal year, and are a function of the cost of options and the portfolio earned rate
 - For example, if portfolio earned rates decrease, then the credited rates will be lowered to reduce the cost of options
- The goal is to adjust credited rates to maintain the necessary investment margin to achieve profit targets (e.g. IRR, ROE)
- Key difference between traditional fixed annuities and FIAs are that the credited rates (e.g. cap rate) do not flow through to the bottom line. Instead, the cost of options drive the interest crediting expense

US GAAP Reserves

- US GAAP Reserves for FIAs are governed by SFAS 133 & 157 which requires splitting the contract into two pieces at issue: (1) Host and (2) Embedded derivative
- There are (at least) two potential approaches for calculating the embedded derivative:
 - Use a stochastic model with many equity & interest rate scenarios: The embedded derivative is the average over these scenarios of the PV of index benefits (not common in the industry).
 - The Option Budget Method (more common practice).
- What's the Option Budget Method:
 - The current term index guarantees are marked-to-market at each valuation period
 - The future term index benefits are not guaranteed, e.g. cap rates can be raised or lowered to control the cost of the options.
 - An option budget is assumed: we want to spend x% to hedge the index guarantees
 - The option budget of x% is used to calculate future index benefits
 - The option budget may be constant or varying with time (e.g. as a function of earned rate)
 - The option budget method is an approximation of the stochastic model approach

US GAAP Reserve At Issue Example

- Example below is for a 7 year surrender charge product that assumes a 2% option budget and a MGCV of 87.5% of premium with a guaranteed rate of 1.5%
- Total Embedded Derivative at issue is the discounted value of column (7) = 14.36

| (1) | (2) | (3) | (4) | (5) = (2) – (4) | (6) | (7) = (5) * (6) |
|------|--------|-------------|---------------------|-----------------|-------------------|-------------------------------|
| Time | AV | Growth Rate | Max (Premium, MGCV) | Option Payoff | Payout Percentage | Embedded Derivative Cash Flow |
| 1 | 102 | 2% | 100 | 2 | 1% | 0.02 |
| 2 | 104.04 | 2% | 100 | 4.04 | 1% | 0.04 |
| ... | ... | ... | ... | ... | ... | ... |
| 8 | 117.17 | 2% | 100 | 17.17 | 40% | 6.87 |
| ... | ... | ... | ... | ... | ... | ... |
| 20 | 148.59 | 2% | 117.85 | 30.74 | 7% | 2.15 |

- At contract inception, the host is the initial premium less the embedded derivative. At contract “maturity”, the host is the MGCV
 - A host growth rate is solved for at inception so that Host = MGCV at “maturity”
 - Host value at future valuation dates will equal the initial host grown at the host growth rate.
- Growth rate for current term should reflect market value of option



Embedded Derivative and Hedging

- Hedging typically focuses on the current term as cap rates can be reset and cost of option can be managed
- For reserving, the embedded derivative is calculated as the fair value of all index benefits which is the accumulated value of past index benefits plus the present value of current and future term index benefits using best estimate / market consistent assumptions
- Key drivers of the hedge portfolio:
 - Equity risk is the primary driver of the hedge portfolio
 - Over 1 year, interest rate movements play a relatively small role
 - Equity volatility can also matter depending on the crediting strategy
 - Surrenders also matter as the hedge portfolio must be rebalanced if surrenders significantly deviate from expected surrenders
- Key drivers of the embedded derivative:
 - All the drivers of the hedge portfolio
 - Plus interest rates are much more significant due to future term index benefits
 - Non-performance risk (NPR) is added to the discount rates
- These differences in asset & liability valuation can lead to significant mismatch (gains / losses) on the GAAP income statement

Value Creation is a Team Effort Across Multiple Groups

Interest Crediting

Renewal credited rate management
Measuring performance

Asset Liability Management

Duration Management
Rising rate risk

Valuation and Finance

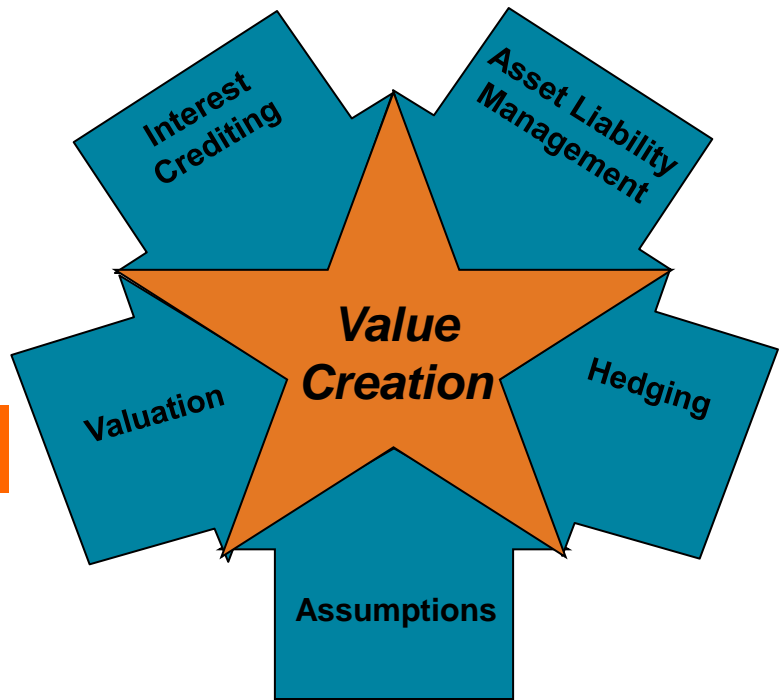
Setting expectations
Attributions

Hedging

Dynamic hedging
Actual-to-expected option costs

Assumptions

Experience studies
Predicting behavior



Inforce Management Value Creation – Interest Crediting

- Renewal credited rate management
 - One of the primary management tools for achieving priced for returns and improving underperforming block
 - Customer expectations and internal policies will be key considerations
 - Alignment with forecasting models
- Measuring performance
 - Internal rate of return
 - Spread based approach
 - Assumption impacts on performance
 - Policyholder behavior (e.g. lapse rates)
 - Company specific assumptions (e.g. target capital, expenses)

Inforce Management Value Creation – ALM

- Duration management
 - Measurement and management of the duration will be key to sustained profitability
 - Key considerations: Duration, convexity and cash flows
 - Potential risk/reward analysis on the amount and type of non-Investment Grade corporate bonds
- Rising rates risk
 - Most FIA products contain full book value guarantees or partial book value guarantees subject to a floor¹
 - Rising rates may present a material risk for portfolio based products as credited rates would not keep pace with new money rates
 - In addition to strong duration management, hedging the risk of sharply rising rates and appropriate liquidity planning is important

¹ Guarantees are generally based on the claims-paying ability of the issuing insurance company.

Inforce Management Value Creation – Hedging

- Dynamic hedging
 - Choice to statically hedge using over-the-counter options or dynamically hedge with futures
 - Dynamic hedging may mitigate over/under performance stemming from assumption estimates and hedge lag
 - Ability to create value will be based on liability dynamics (i.e. curvature), relationship of implied vs. realized volatility, liquidity of instruments, bid/ask spread, etc.
- Actual-to-expected option costs
 - Option budget assumed in pricing vs. option cost experienced
 - Stronger understanding and more accurate reflection of option costs will result in a more accurate estimate of profitability

Inforce Management Value Creation - Assumptions

- All aspects of managing the block (e.g. interest crediting, ALM, hedging, valuation, etc.) are reliant on a good set of product assumptions
- With movement toward a principles-based approach on statutory reserves, experience information will play an even larger role in the financial results
- Assumptions become more critical to profitability on guaranteed withdrawal benefits
- Experience studies
 - At minimum, annual studies on key assumptions with more frequent updates on top 2-4 assumptions as experience emerges
 - Gathering of industry data and utilization of consultants to compare experience
 - Given limited experience on withdrawals from guaranteed benefits, may leverage experience on variable annuity experience for insights

Inforce Management Value Creation – Valuation/Finance

- Valuation of FIA liabilities are directly dependent on information from interest crediting, hedging and assumptions
- Setting expectations
 - Create expectations prior to month/quarter end with respect to the entire income statement in collaboration with finance team
 - Include all key items of the income statement (e.g. investment income, interest crediting, hedge gain/loss, reserves etc.)
- Attributions
 - Comparison of actual results to expected results for each key driver
 - Create constant feedback loop for improvements on expectation setting

QUESTIONS