33rd India Fellowship Webinar

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Case Study 4

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Agenda

- ❖ Understanding the problem

- ❖ Solving the problem
  - ✓ General Analysis to be Performed
  - ✓ Key Metrics for Existing & New Business
  - ✓ Key Regulations & Professional Guidance
  - ✓ Possible Steps to manage these guarantees

Defining the Problem

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- Our company recently started selling non-participating savings products providing high level of long term investment return guarantees to the policyholders. Products sold include limited premium payment endowments, with customer maturity IRRs of around 5%.

- Long term interest rates have started to decline in India

- Falling asset yields can have a significant impact on the profitability of non-participating products if the assets are not adequately matched to the liabilities. Profit Margin of New products will be impacted unless they are repriced. Capital adequacy and solvency of the company can also be adversely impacted depending on the underlying regulations, and company’s investment strategy.

GENERAL ANALYSIS PERFORMED

General Analysis Performed (1/2)

➢ **Asset-Liability Analysis**

- ❖ Asset-Liability Management analysis needs to be performed comparing the impact on the values of assets and liabilities (and hence, surplus) of a change in interest rates
- ❖ Impact of both Parallel and non-parallel shifts in interest rates should be considered on the cashflows and their present values.
- ❖ Impact of changes in interest rates can be demonstrated though a Price Behavior Curve, and comparing duration and convexity measures
- ❖ The key risk for the company is new money investment risk (i.e. the risk that the returns on future considerations received under a contract may not be comparable to the initial pricing assumptions)
- ❖ Analysis should be performed at a standalone LOB level, as well as the entity level
- ❖ Impact of Policyholder behavior should also be allowed in the analysis

General Analysis Performed (1/2)

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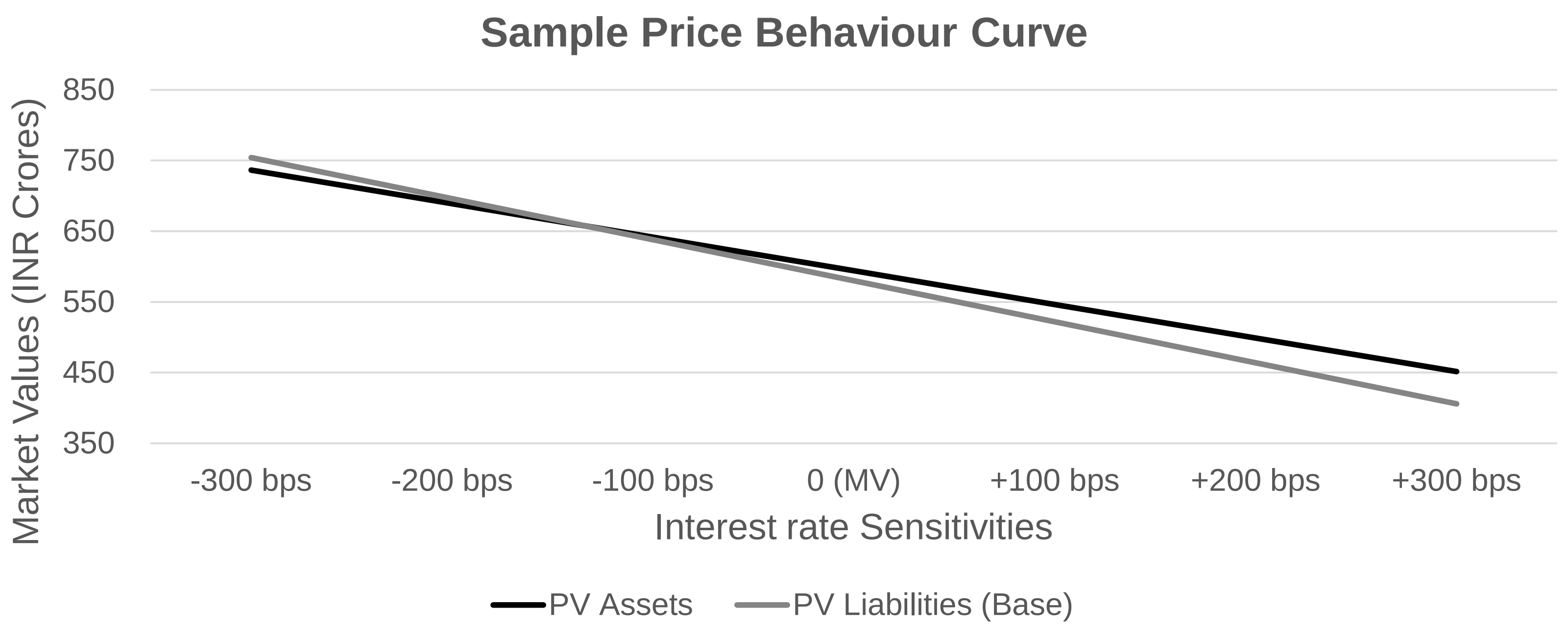
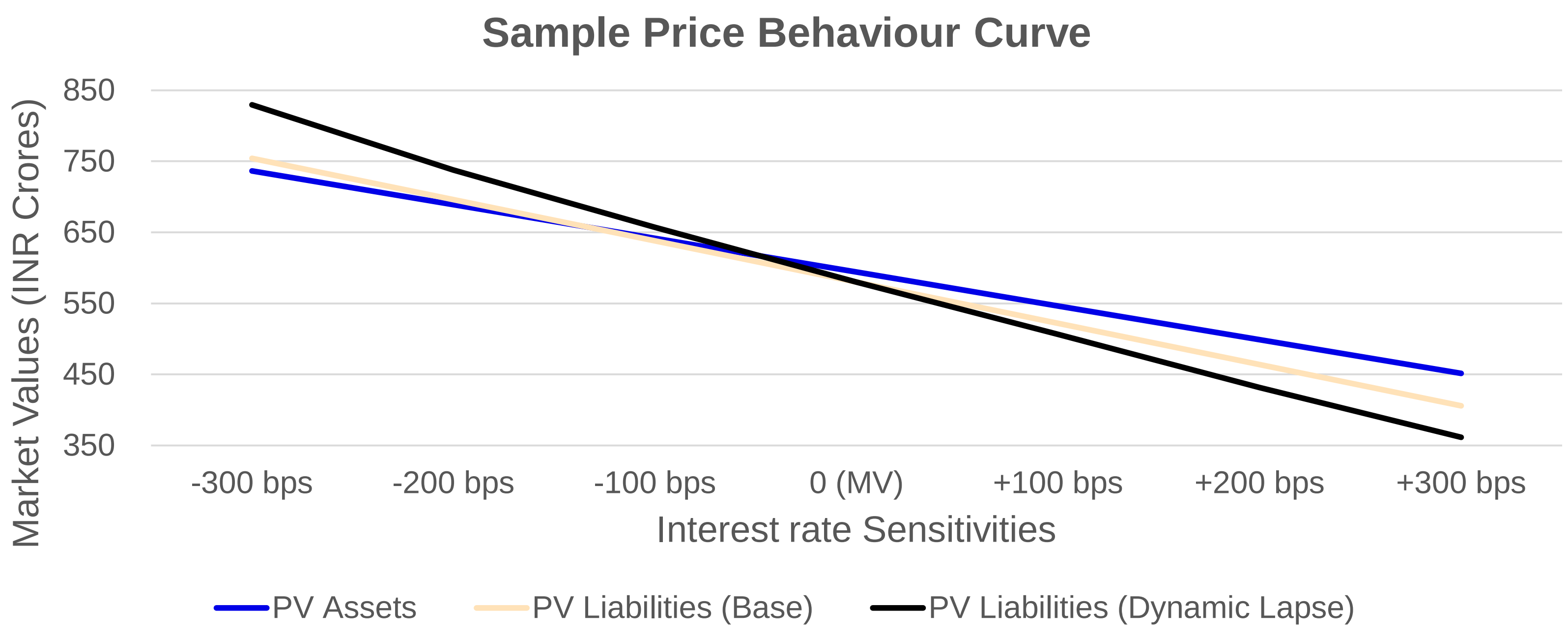
- **Asset-Liability Analysis**
  - Sample Interest rate scenarios that can be considered:

Scenario	**Example**
Level Decrease	Parallel decrease of 100bps in the yield curve
Falling	Uniformly decreasing at 75 bps per year over 10 years (subject to a floor) and then level
Fall and Return	Uniformly decreasing at 75 bps per year over 5 years and then uniformly increasing at 75 bps over the next 5 years and then level
Pop-Down	An immediate decrease of 300 bps in the first year and then level
Immediate Fall and Return	An immediate fall of 200 bps in the first year followed by a rise of 200 bps in the second year and then level

General Analysis Performed (1/2)



General Analysis Performed (1/2)



	-300 bps	-200 bps	-100 bps	0 (MV)	+100 bps	+200 bps	+300 bps
Lapses (annualised)	4%	5%	7%	8%	9%	12%	14%

General Analysis Performed (1/2)

- **Asset-Liability Analysis**

  - Impact of various management actions should be analyzed:
    - Varying the level of Special Surrender Value – subject to the guaranteed surrender value floor
    - Decision to partially or fully hedge reinvestment rate risk

  - For non-parallel shifts in interest rate curve, an analysis of Key Rate Durations (KRD's) can also be performed for assets and liabilities.

  - Level of detail in which analysis performed will depend on the existing processes, systems and talent capabilities.

General Analysis Performed (2/2)

- **Supplementary Analysis**

  - Impact of interest rates fall on persistency
    - This could be done by treating lapse rates as a dynamic function of:
      - A) Existing Interest Rates, and
      - B) Guaranteed Interest Rates
        However the company may not have not have sufficient experience to perform the analysis; and instead may apply margins to existing best estimates

  - Decreasing the level of Surrender Value payout
    - Impact of fall in interest rates on Asset Share
    - Competitor's Reactions
    - Policyholder's Reasonable Expectation:
      - Past Practice (may not be any precedent)
      - Any communications to the policyholder

General Analysis Performed (2/2)

- **Supplementary Analysis**
  - Impact on per policy expenses
    - Repricing non-participating endowment business to maintain profitability will decrease attractiveness in the eyes of the customers
    - Lower business volumes will lead to higher per policy expenses
    - The magnitude of impact will depend upon:
      - The extent of repricing
      - Any similar actions taken by competitors

KEY METRICS FOR EXISTING BUSINESS & NEW BUSINESS

Key Metrics - In-force Business

- **Profitability: Embedded Value**
  - Measure impact on:
    - Adjusted Net Worth
    - VIF
  - Measure impact at both – entity and product level
  - Consider Impact of Impact of change in Policyholder behavior (by Product Group) and Management Actions

- **Reserves and Solvency Ratio**
  - Measure impact on Required Reserves and Solvency Ratio at an entity level
  - Update the best estimate and reserving assumptions for all relevant parameters
  - If duration of assets is less than liabilities – Best estimate discount rate may fall
  - Identify and analyze possible courses of actions If the required solvency ratio or preferred level of liquidity cannot be maintained

Key Metrics - New Business

- **Profitability: VNB Margin**
  - Determine VNB Margin on existing terms
    - Higher Persistency
  - Determine VNB Margin on Revised terms (If Repricing)
    - Lower Guarantees

- **Profitability: VNB / Capital Required**
  - When Capital availability is a constraint
  - Consider Revised Terms of Issue
    - E.g. Single Premium / Limited Premium vs Regular Premium

VNB Margins need to be compared with other products on offer (allowing for the level of guarantees in the product)

REGULATORY REQUIREMENTS & PROFESSIONAL GUIDANCE

IRDAI Regulatory Requirements (1/4)

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IRDAI (Appointed Actuary) Regulations, 2017

IRDAI (Assets, Liabilities, and Solvency Margin of Life Insurance Business) Regulations, 2016

IRDAI (Actuarial Report and Abstract for Life Insurance Business) Regulations, 2016

IRDAI (Investment) Regulations, 2016

IRDAI Guidelines on Interest Rate Derivatives dated 2014

IRDAI Circular on Asset Liability Management and Stress Testing dated 2012

IRDAI Regulatory Requirements (2/4)

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IRDAI (Assets, Liabilities, and Solvency Margin of Life Insurance Business) Regulations, 2016

Assets	Liabilities	Solvency margin
❿Admissible assets ❿**Allowance of investment strategy in liabilites valuation**	• Prospective method of calculation • Consider all policy cash flows • **Consider cost of any options and guarantees** • Appropriate level of MAD	• Minimum solvency requirement • Determine available solvency margin, required solvency margin and solvency ratio • **Monitoring solvency and change investment strategy accordingly**

IRDAI Regulatory Requirements (3/4)

IRDAI (Appointed Actuary) Regulations, 2017

- Effective implementation of risk management strategies
- Consideration of policyholders' reasonable expectations

IRDAI (Actuarial Report and Abstract for Life Insurance Business) Regulations, 2016

- Ensuring data and methodology is consistent with ARA
- Appropriate additional reserves as per ARA

IRDAI (Investment) Regulations, 2016
IRDAI Guidelines on Interest Rate Derivatives dated 2014

- Board approved Risk management strategy
- **Insurers permitted to invest in Forward Rate Agreements (FRAs), Interest Rate Swaps (IRS), Exchange Traded Interest Rate Futures (IRF)**
- **Can be used for hedging only interest rate risk**
- **Can only be used to hedge reinvestment risk on existing business but not future business**
- Corporate governance
- Regular Reporting and Audit

IRDAI Regulatory Requirements (4/4)

IRDAI Circular on Asset Liability Management and Stress Testing dated 2012

- Board approved ALM policy; submitted to IRDAI
- ALM policy to examine all the risks affecting the assets and liabilities
- **Measure the interest rate risk in particular**
- **Stress testing helps to ascertain level of vulnerability to different scenarios**

Financial reinsurance as an option.

RBI guidelines intend to rationalize interest rate derivative regulations

Professional Guidelines (1/2)

Actuarial Practice Standards

APS 2 : Additional Guidance for Appointed Actuary and other Actuaries involved in Life Insurance

- Valuation parameters
- **Additional provisions – investment guarantees**
- Meet solvency requirements at all times

APS 3 : Financial Condition Report

- **Assess the company's ability to change in external environment and other conditions**

Professional Guidelines (2/2)

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Actuarial Practice Standards

APS 7 : Appointed Actuary (AA) and Principles for determining Margins for Adverse Deviation (MAD) in Life Insurance liabilities

- Appropriate level of MAD
- Professional judgement
- Higher MAD -> Greater prudence -> Higher reserves
- Reaction to adverse experience
- Appropriate MAD for investement guarantees

Guidance Note 22

Reserving for Guarantees in Life Assurance Business

- Recommends use to stochastic model for calculation of reserves
- Alternatively, deterministic and closed form solutions can also be used.

POSSIBLE STEPS TO MANAGE THE GUARANTEES

How we might manage these guarantees?

Reserving

- Robust Reserving Methodology

Asset - Liability Matching

- Hedging/ Derivatives
- Regular Monitoring

Product & Pricing Restructuring

- Product refiling
- Combo product

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Reserving

Based on the expected changes in the investment yield and the potential change in policyholders' behaviour, the appointed actuary can relook at the valuations assumptions and/or MAD with compliance to APS 7 and can take the following steps –

STEPS	BENEFIT	OTHER CONSIDERATIONS
Lower Valuation Interest rates	Reserve which better reflects the guaranteed liability	Extra Capital may be required to meet the increased reserves
Lower Lapse rates		Possible impact on profitability & margins

Asset Liability Matching

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Based on the asset-liability model, the company will ascertain the matched position of its portfolio and can take the following steps –

- Regular monitoring of the assets & liabilities by duration & occurrence
- Based on the entity level ALM analysis, understand the overall picture of the company and take corrective measures like utilization of excess assets at short duration at later period.
- Changes in investment portfolio based on the ALM exercise – e.g. investment in partly paid bonds
- Inclusion of derivatives to hedge the interest rate risk
- Ensure Solvency is maintained under various scenarios & investment choices
- Ensure proper framework & governance of investment strategy

Hedging Interest rate risks

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Hedging (using derivatives, or even partly paid bonds) can be an attractive method to reduce interest rate risk and potentially reduce capital strain.

Potential derivative strategies

Interest rate swaps (IRS)

Advantage

- Available to hedge 5 (or even 10) years of cash flows

Shortcomings

- Basis risk remains between MIBOR and insurers
- Swap spread has been historically large and volatile

Interest rate futures (IRF)

Advantage

- Basis risk may be reduced as contracts are available on 10 or 15 year GSECs

Shortcomings

- Typically only liquid to hedge cash flows for short periods (e.g. one quarter)
- Roll over creates cost and additional risk

Forward rate agreements (FRA)

Advantage

- OTC contracts which can hedge up to around 10 years of cash flows on an underlying (assets) of your choice
- Results in lower basis risk if selected carefully

Shortcomings

- Involves complex accounting for insurers

Financial Reinsurance

As an alternative to hedging, another method of managing capital requirements is through the use of financial reinsurance.

01 Will help to improve the asset position of the company without any impact on the liability

02 Fin Re products can improve investment freedom, IRR on products and some Fin Re products guarantee future surpluses

03 May not be a practical option currently given the regulatory constraints on reinsurance without any risk transfer

Product Restructuring & Refiling

For managing both the existing business and the new business, the following options can also be looked

Existing business

- If possible, revise the SSV factors to reflect the lower investment yield and change in asset share

Product Restructuring

- Offer the product as a combo with a unit-linked product in order to reduce the guarantees and refrain from complete withdrawal of the product

Product Refiling

- Re-pricing and re-filing of the product by changing the assumptions, surrender values and/or offering single premium option to reduce reinvestment risk

Business Strategy

- Change in business strategy by not offering products with guarantees
- Offering an index-linked product given the uncertainty behind long term interest rates.

Other factors to Consider

There are various other steps and factors which the company can consider in managing the guarantees and the associated risk –

Look at the competitors' strategy to avoid any secondary risk by being an unnecessary market differentiator

Consider the possible implication on reputation and sales volume on reducing the guarantees/ surrender values

Need to consider the accounting implications of using complex investments and derivatives

The probable cost and expertise required in investing into derivatives should be weighed against the benefit achievable from the same.

Need to consider the operational and administration challenges in derivatives and/or financial reinsurance

Any Questions ?

Thank You