

Unit-Linked Investment Guarantees

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10th Global Conference of Actuaries
Mumbai, India
February 2008

This presentation is incomplete without the accompanying oral briefing.

■ Background

- types of investment guarantees
- international experience

■ Market Opportunities

- why are investment guarantees attractive?
- outlook for India

■ Product Management

- what are the risks?
- how can the risks be managed? (e.g. dynamic hedging)
- pricing investment guarantees

■ Conclusion

Background

Unit-linked investment guarantees can be provided in different ways



Conservative capital guaranteed funds

- Investment risk (minimal) lies with customer
- Limited upside
- Limited fund choice

“Limited entry” capital guaranteed investments

- Open for limited time
- Single fixed maturity date guarantee
- Limited fund choice
- Provider may adjust asset mix to market
- Low liquidity

Unit-linked investment guarantees

- Choice of “add-on” investment guarantees
- Choice of funds
- Exposure to upside

- Unit-linked investment guarantee products:
 - provide range of “add-on” investment guarantees
 - called “variable annuities” in US, but not necessarily an annuity!
 - can be thought of as Ulip with a variety of “building block” guarantees:

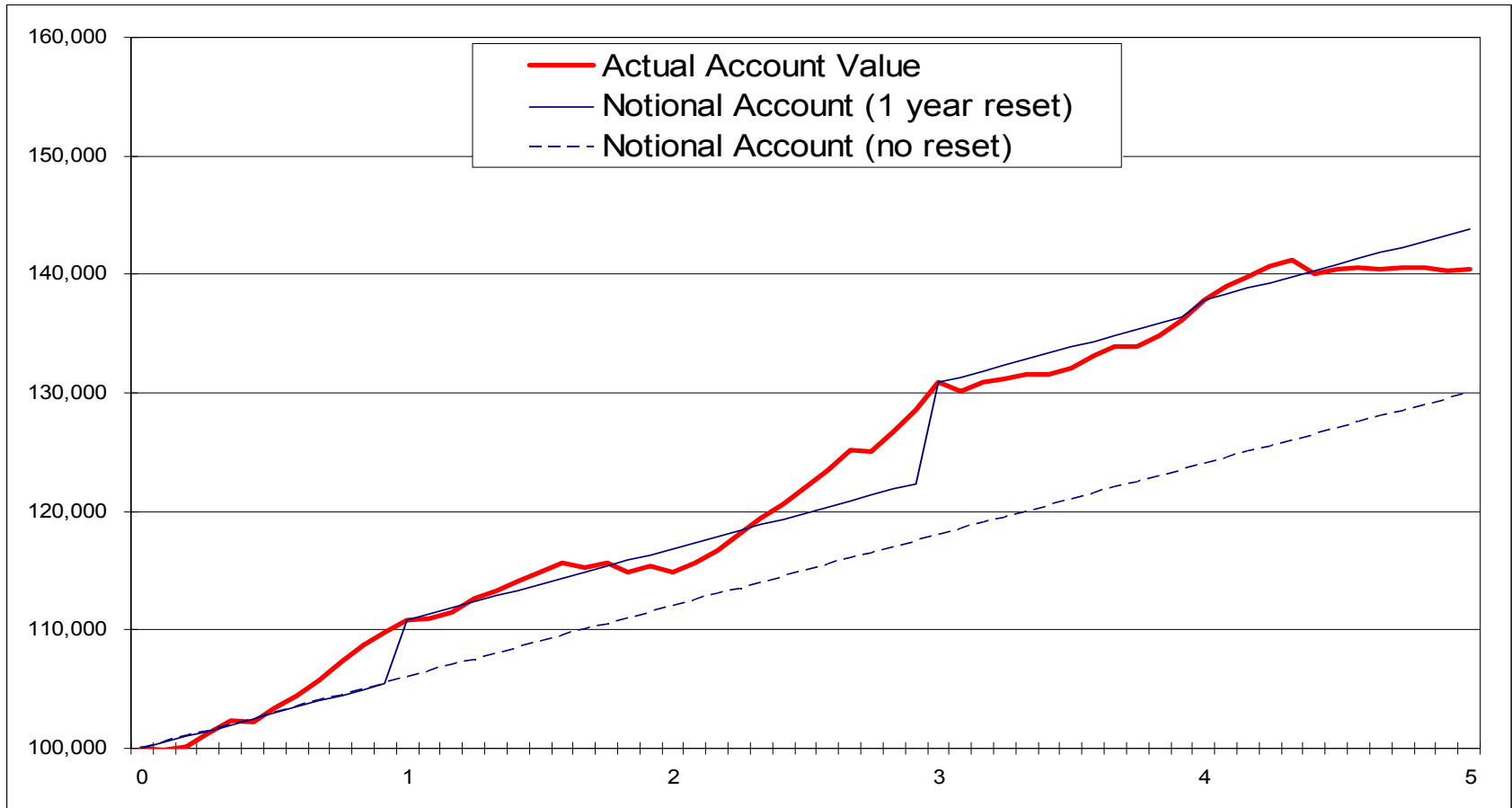
Guaranteed Minimum Death Benefit (“GMDB”)	Guaranteed Minimum Income Benefit (“GMIB”)
E.g. on death, sum assured is $\max(\text{FV}, \text{Premium Roll-up})$	E.g. on annuitisation, consideration $\max(\text{FV}, \text{Premium Roll-up})$; combine with guaranteed annuity rate
Guaranteed Minimum Withdrawal Benefit (“GMWB”)	Guaranteed Minimum Accumulation Benefit (“GMAB”)
E.g. on partial withdrawal, total withdrawal at least % of Premium	E.g. at specified term, maturity value is $\max(\text{FV}, \text{Premium Roll-up})$

- These 4 basic building blocks can be combined and tweaked to create sophisticated offerings:
 - over 40 different types of complex guarantees in N. America
 - new guarantees still appear regularly
- Provides customer with combination of upside exposure in fund and downside protection

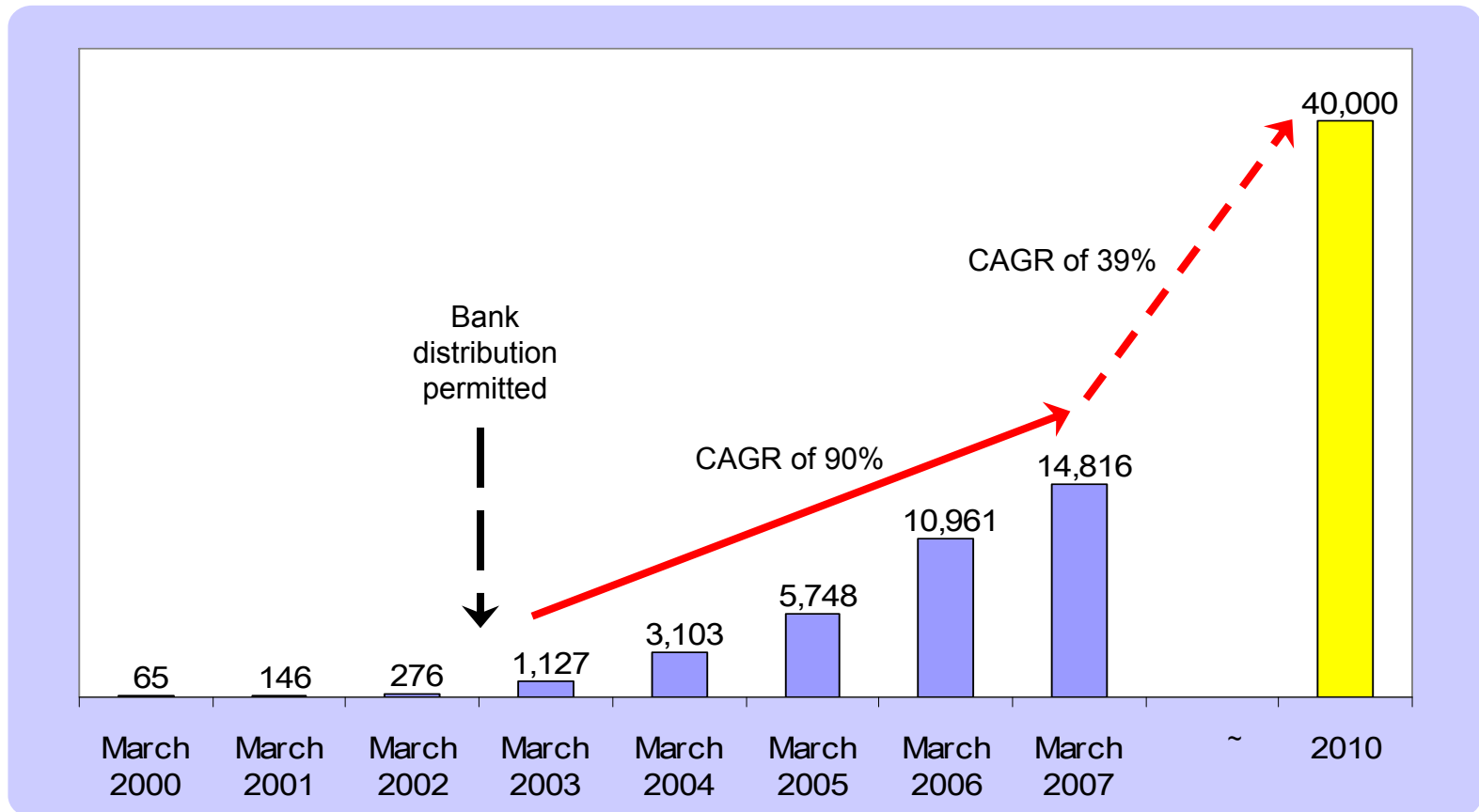
Illustration of GMAB benefit:

- Simple investment guarantee design
- Opening account balance of \$100,000
- Annual contributions of \$6,000 (\$500 pm)
- GMAB details:
 - 0% guarantee
 - 5 year guaranteed term
 - reset frequency – none and annual

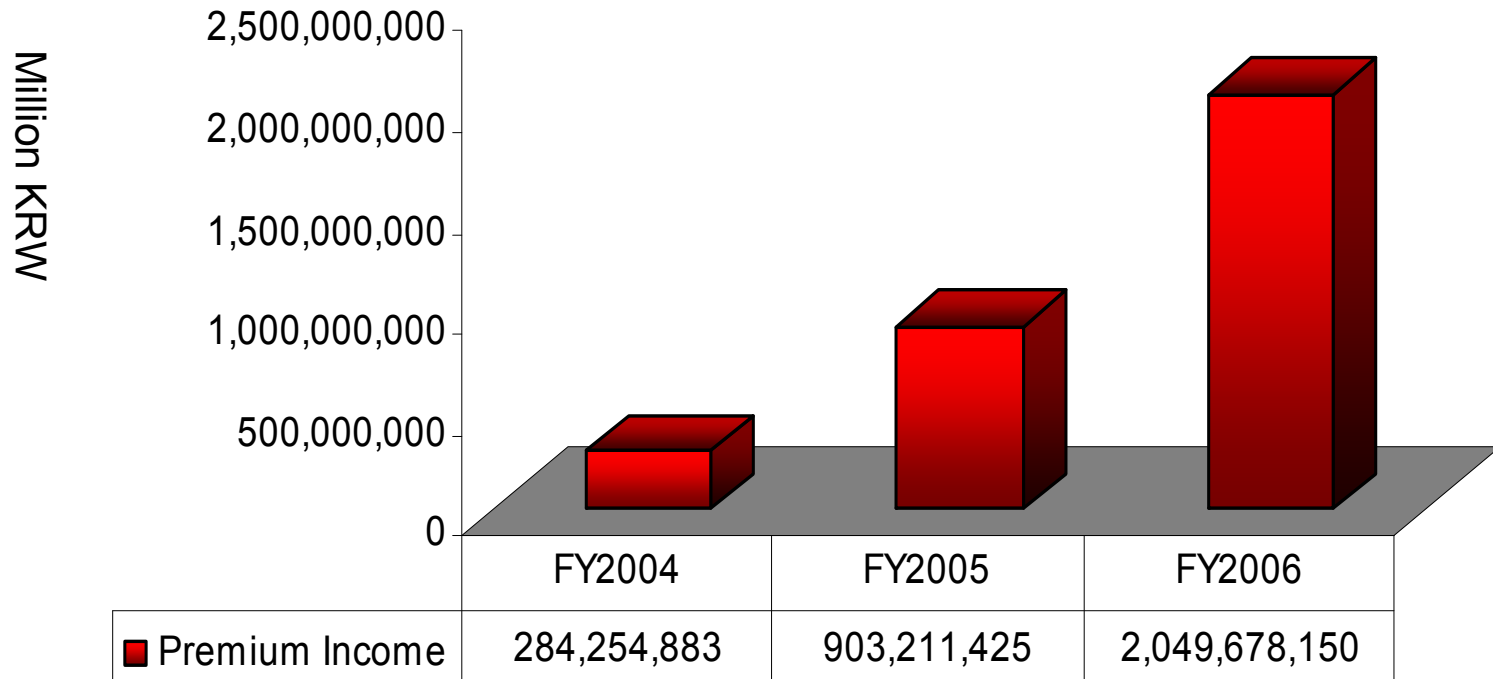
Illustration of simple 0% GMAB in single scenario



VA Assets Under Management (JPY billion)



New Business Premium Income for Variable Annuity



Source: Korea Life Insurance Association

Experience in Europe

Significant growth of unit linked market share in most European countries

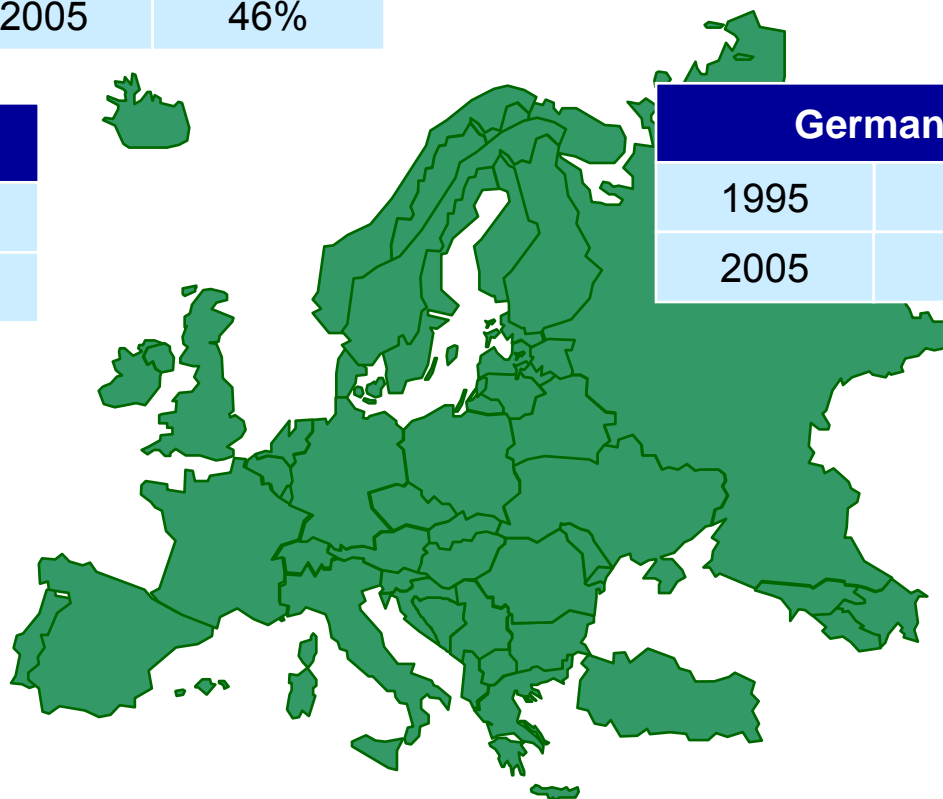
Sweden	
1995	19%
2005	46%

Austria	
2003	21%
2005	27%

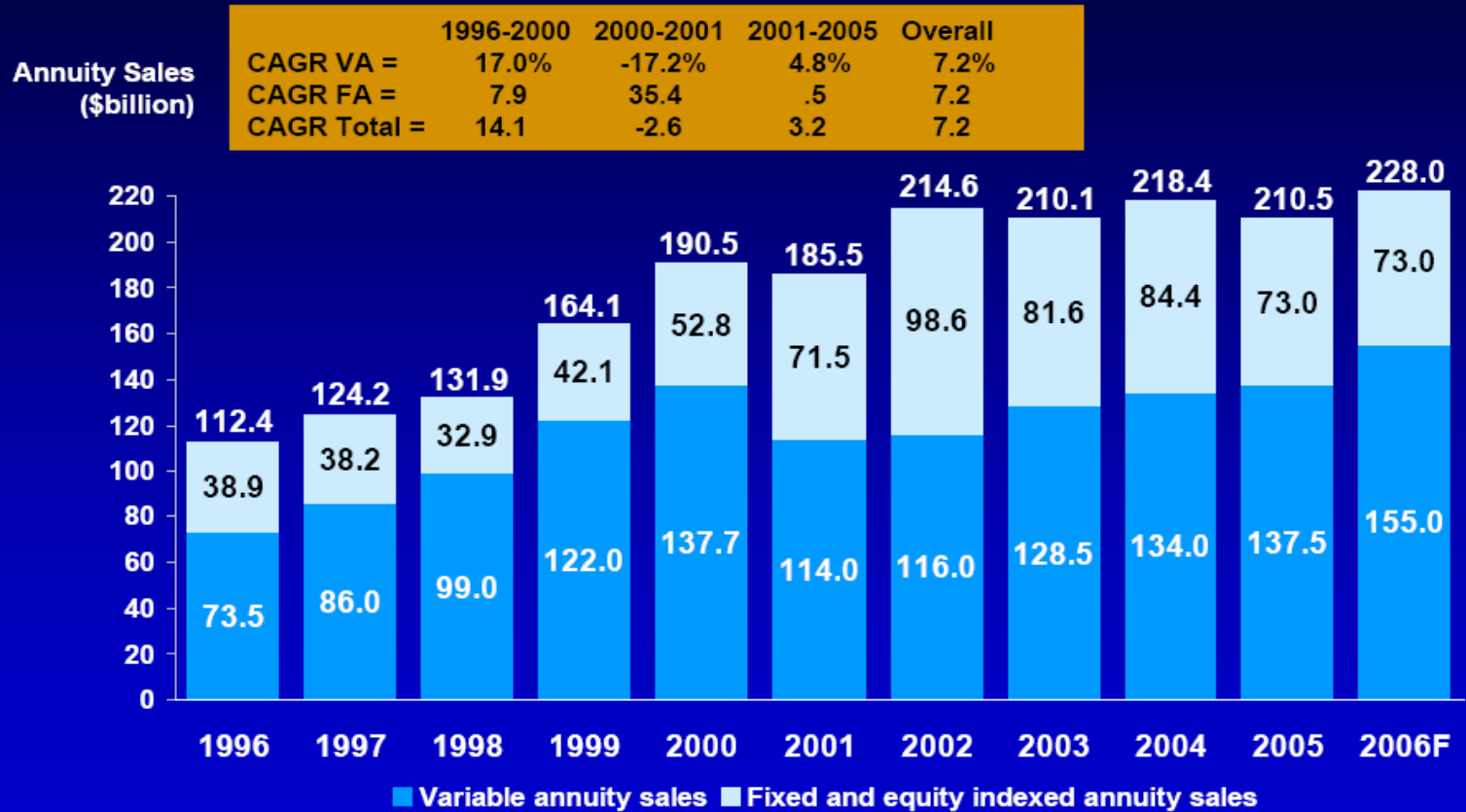
UK	
1995	44%
2004	75%

Germany	
1995	5%
2005	26%

Italy	
1998	14%
2005	25%



Mix of U.S. Annuity Gross Sales



Source: Variable sales from Tillinghast VALUE Survey ("VALUE"), includes all non-pension variable annuity premiums (first-year and renewal, separate account and fixed account). Fixed sales from LIMRA, includes deferred and immediate annuities, EIAs, and MVA (excludes structured settlements).

Market Opportunities

Why are investment guarantees attractive?

Different reasons in different countries, but broadly:

- Consumers
 - Investor demand
 - want exposure to growth assets plus downside protection
 - “lock-in” bull market returns
 - Legislative changes
 - customers taking on more investment risk
 - Demographic changes
 - aging population leading to retirement income concerns

Why are investment guarantees attractive?

Different reasons in different countries, but broadly:

- Companies
 - Unit-linked product marketing advantage
 - product differentiator
 - additional “bells & whistles”
 - Improved saleability of unit-linked products
 - requested by distribution
 - Ability to provide guarantees
 - improvements in financial hedging techniques
 - Lower lapses of base product during market turbulence
 - Additional source of fee income for companies

- Strong bull market in recent times
- Strong growth in Ulips market
- Increased exposure of Ulips to equity and greater volatility
- Clear customer desire for investment guarantees
- Need for product differentiator on Ulips
- Current investment guarantee product offerings:

Product Management

Typical risks associated with investment guarantees:

Market Risks

- change in underlying UL funds (delta)
- change in rate of change in underlying UL funds (gamma)
- change in interest rates (rho)

Non-Market Risks

- change in policyholder behaviour (e.g. selective withdrawals)
- change in mortality rates (e.g. longevity risk)

Operational Risks

- mis-representing the extent of guarantees to customers
- not executing a hedging strategy as planned
- failure of hedge strategy

Each risk type requires a risk management strategy

- amount of effort dependent on size of risk exposure
- size of risks measured as follows:
 - simple market risks → the “greeks”
 - complex market risks → stochastic financial model
 - non-market risks → stress tests
 - operational risks → stress tests, but actual events not available
- deriving common risk measures is a challenge

Risk management strategies – Market Risk

Stay naked	Not recommended as long-term strategy
Static protection	Investment bank may be able to tailor protection to particular needs
Outsource guarantee	Use investment bank to provide the investment guarantee
Reinsure	May be way of transferring unwanted risk
Dynamic hedging	Regular (daily) monitoring of the hedge position against pre-defined limits
Hold capital	Cover residual risk by holding capital

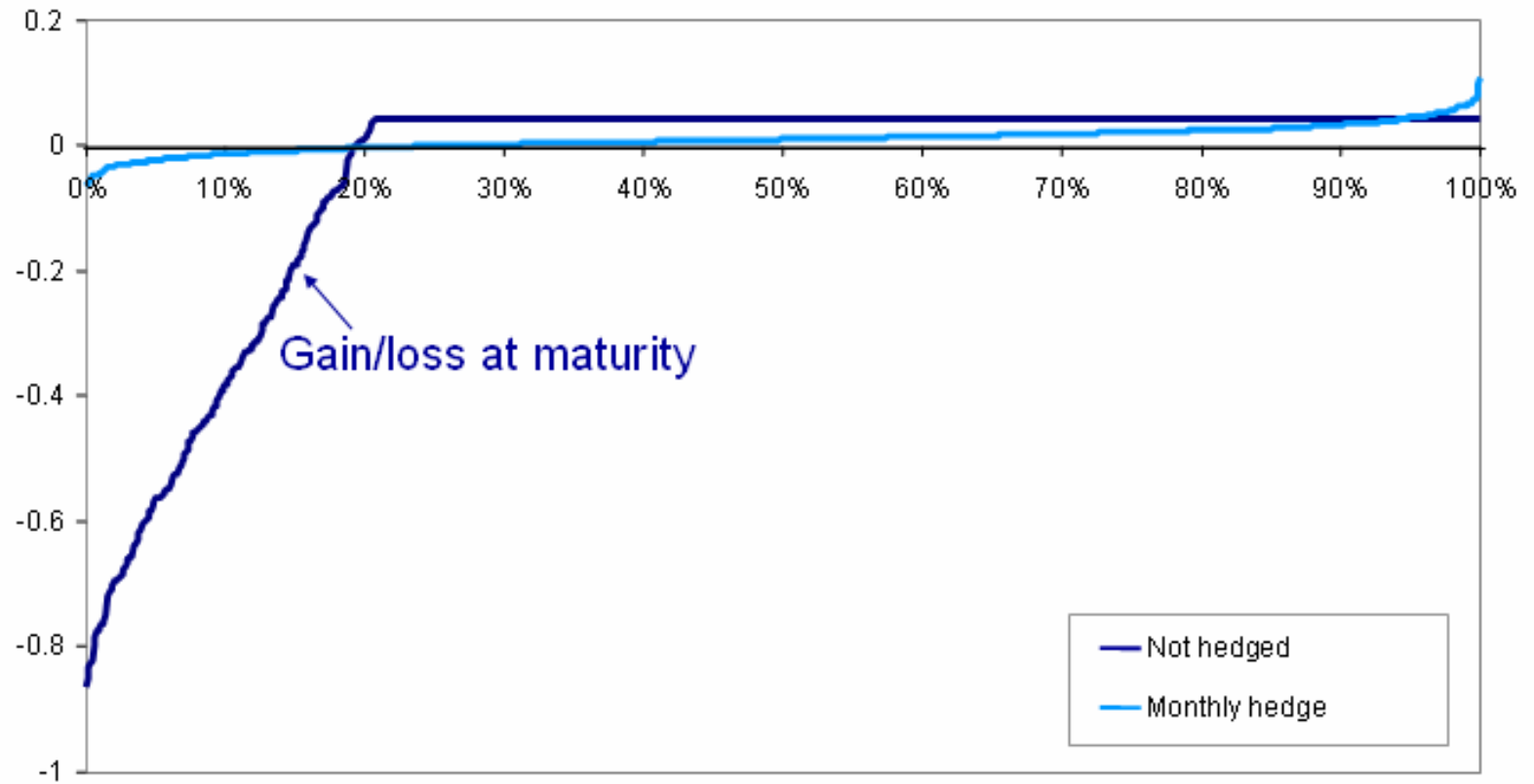
- Good product design can reduce the risks associated with investment guarantees
 - limiting fund choice and mix
 - only offer guarantees that are wanted
 - investment guarantee charging basis (e.g. granularity, method)
 - guarantee gross of fees

How can the risks be managed?

Dynamic Hedging



Dynamic Hedging



Most adverse scenario

All possible scenarios

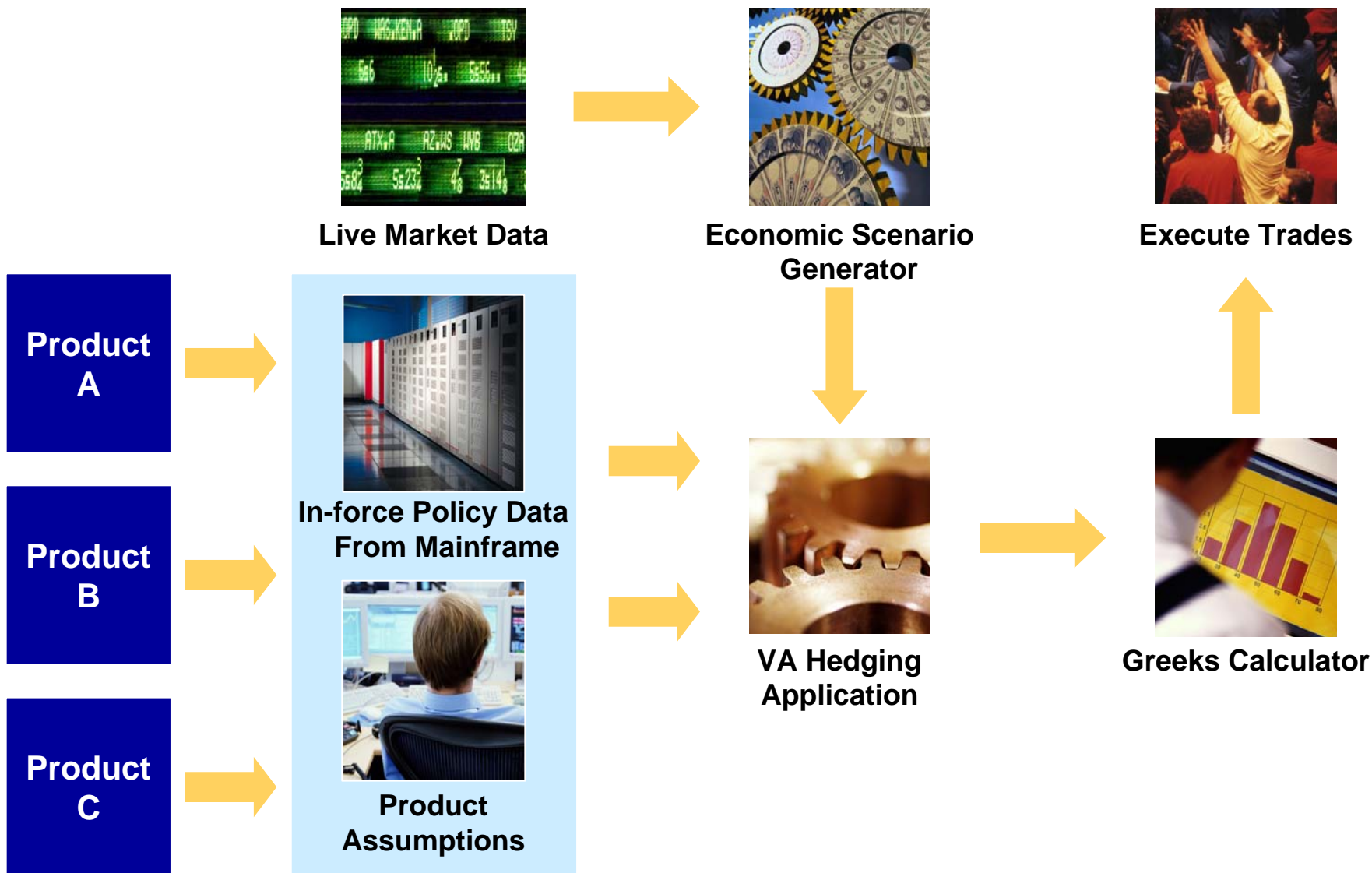
Best possible scenario

Dynamic hedging requires certain decisions:

- What should be hedged?
- How should it be hedged?
- At what level should the risk limits be set?

Hedge strategy	What is being hedged?	How can this be hedged?
Delta	Sensitivity to changes in the price of equity	Futures
Gamma	Sensitivity to changes in the price of delta	Options
Rho	Sensitivity to changes in interest rates	Interest rate swaps
Rho Convexity	Sensitivity to changes in the rho convexity	Interest rate caps and floors and swaptions

Dynamic Hedging Process



■ Advantages of dynamic hedging approach:

- reduced profit volatility
- ability to continuously adapt to changing market conditions
- value created by managing hedging in-house
- limited credit risk
- better knowledge of the risks
- more flexible approach to product design and pricing
- reduced tail risk

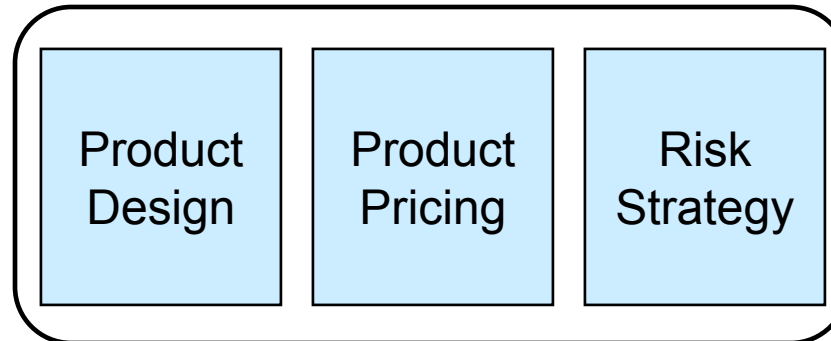
■ Issues with dynamic hedging approach:

- residual market risk (e.g. hedge slippage, basis risk)
- transaction expenses
- requires continuous checks, controls and reporting
- sophisticated systems and expertise
- introduces operational risks due to complexity
- lack of hedge instruments (long-term volatility or correlations)
- trade-off between accuracy and cost

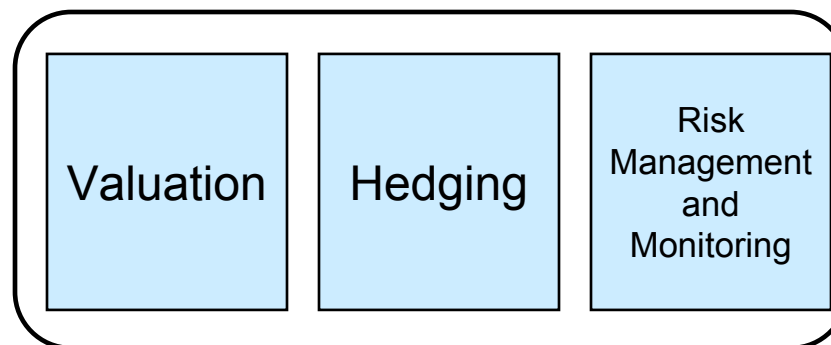
- Hedging can address market risk, but capital needs to be held for:
 - residual market risk
 - non-market risk (e.g. policyholder behaviour)
 - operational risk

- Risk management processes are fundamental
 - embedding risk management culture is key

Design Considerations



Implementation Issues



Determine the theoretical guarantee cost

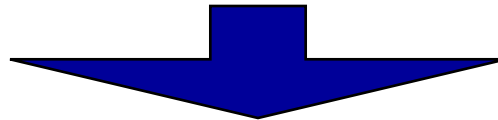
1. Project fund value under stochastic market-consistent economic scenarios



2. For each scenario, calculate PV of the guarantee amount paid



3. Calculate the average of these PVs over the set of stochastic scenarios



4. Calculate an average base guarantee charge

Over the set of stochastic scenarios the average of the PV of the base guarantee charges deducted is equal to the average of the PV of the guarantee amount paid (from step 2)

- But, this is only the first step
 - no allowance for profit margins and cost of capital
 - no allowance for actual costs of hedging
 - guarantee charge likely to be more than the theoretical cost

- Pricing investment guarantees presents challenges:
 - Market-consistent economic scenarios required
 - parameterisation in India
 - Stochastic modelling required
 - complexity
 - Wide range of product designs to consider
 - Repricing required under significant market changes
 - Policyholder behaviour
 - investors may not behave rationally
 - Capital requirements

Conclusion

- Value proposition for the consumer
- ... and for the company
- Wide range of product designs available
- Need to ensure risks are managed appropriately
 - sophisticated techniques available
 - lead time for product development

“Risk comes from not knowing what you're doing.”

Warren Buffett



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Discussion

Company

- risk tolerance?
- complexity?

Consumer

- needs?
- what will sell?

Regulator

- capital requirements?
- illustrations/disclosures?

- Views on investment guarantees:
 - what fee will typical customer pay?
 - what % customers will take-up?

About the Author :

Dion Russell

Dion Russell is a Senior Consultant in the Tillinghast insurance consulting practice of Towers Perrin and has been with the firm since 2003. Prior to joining Tillinghast, he worked for Old Mutual, an international financial services group, in South Africa.

Dion's experience in the Indian market dates back to 2000 when he was involved in the setup of Kotak Mahindra Old Mutual insurance company. More recently, Dion has undertaken product development / pricing work, economic value assessments and external statutory peer review assignments for Indian clients.

Dion's areas of expertise include:

- traditional and market-consistent appraisal values
- product pricing and profit testing
- mergers and acquisitions
- financial projections and modeling
- asset/ liability modelling and insurance option costing
- life company liability valuations
- capital management

Dion is based on Sydney, Australia. His work at Tillinghast has covered several countries in the Asia-Pacific region, including Australia, India, Hong Kong, Taiwan, New Zealand, Singapore, Thailand and Indonesia. He has also worked on projects in the United Kingdom.

Dion holds a Bachelor of Science degree in Actuarial Science from University of Stellenbosch, South Africa. He is an Affiliate member of the Institute of Actuaries of India, a Fellow of the Institute of Actuaries (UK) and a Fellow of the Institute of Actuaries of Australia.