Reliance Capital

Coding Embedded Value by Decoding Pricing

February 2016

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CURRENT TRENDS

- Industry
- Product
- Trend Ahead

PRODUCT PRICING

- About Life Insurance
- Type of Products
- Pricing Assumptions
- A comparison snapshot

EMBEDDED VALUE (EV)

- About EV
- EV Factors & Assumption
- EV Movement & Sensitivity

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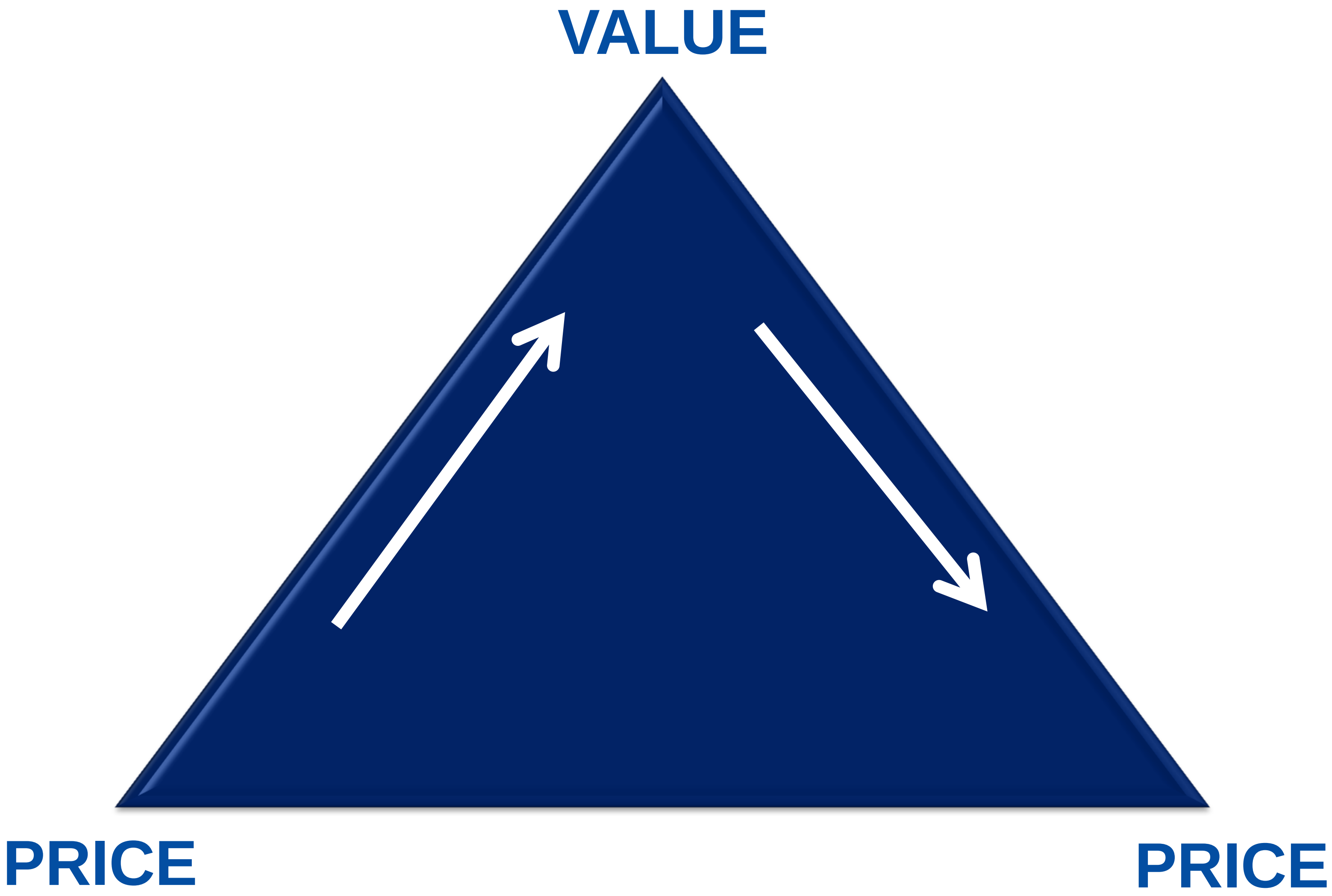
Theme



- India’s economy picked up in 2014-15 to 7.3% vs. 6.9% 2013-14
- In life insurance business, India is ranked 11 among the 88 countries
- India’s share in global life insurance market was 2.1% during 2014
- Insurance density of life insurance rose from USD 9.1 in 2001 to USD 55.7 in 2010
  - During 2014, the level of life insurance density was USD 44
- Life insurance penetration surged from 2.2% 2001 to 4.6% in 2009; declined to 2.6% in 2014
- Life insurance industry’s premium income at Rs. 3,28,101.1 crore during 2014-15 vs. Rs. 3,14,301.7 crore in 2013-14 (+4.4%; 9.44% in previous year)
- Private sector insurers posted 14.3% growth (1.3% decline in previous year) in their premium income; LIC recorded 1.2% growth (13.5% growth in previous year)

- In March - May 2015, 83 products approved; 90% non-linked
- In June - Aug 2015, 25 products approved; most of them from health & annuity category
- In Sept - Nov 2015, many products were Unit linked, online savings & protection, as well as digital space
- Revival in ULIP sales driven by pick up in economic growth, downward trend in interest rates, stock market boom, better awareness about financial assets
- ULIPs registered a growth of 10.85% premium from Rs. 37,544.1 crore in 2013-14 to Rs. 41,616.9 crore in 2014-15
- Traditional products premium growth was at 3.5%, with premium of Rs. 2,86,484.2 crore as against Rs. 2,76,757.6 crore in 2013-14
- Share of unit linked products in total premium increased to 12.7% in 2014-15 as against 12.0% in 2013-14

Trend ahead

- Women oriented protection products - health related
- Children Future Protection Products - education, marriage etc.
- Pension Products - emerging demographic dividends
- Focus on digital space - online protection & savings products
- Products for Worksite marketing

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EMBEDDED VALUE (EV)

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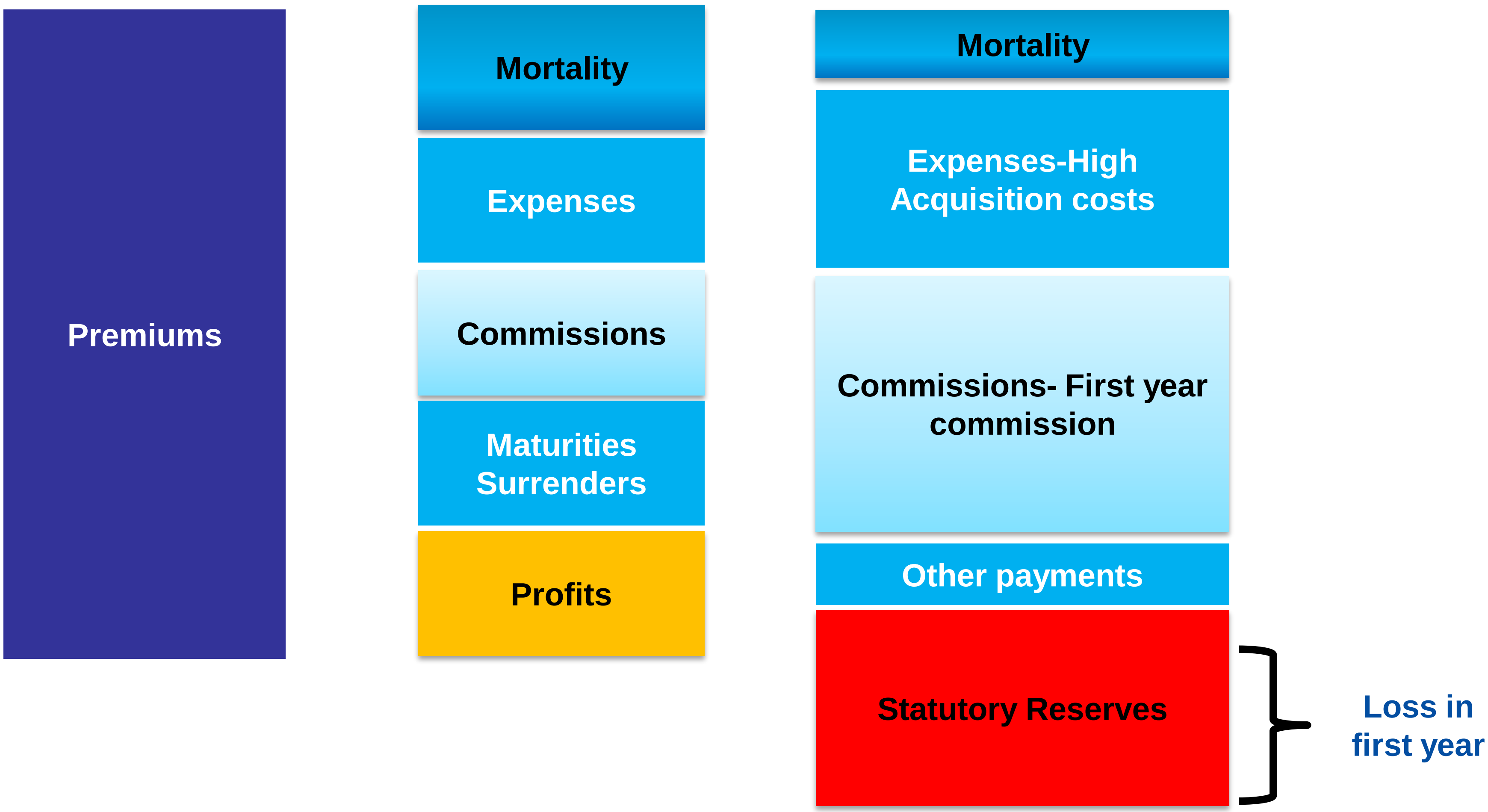
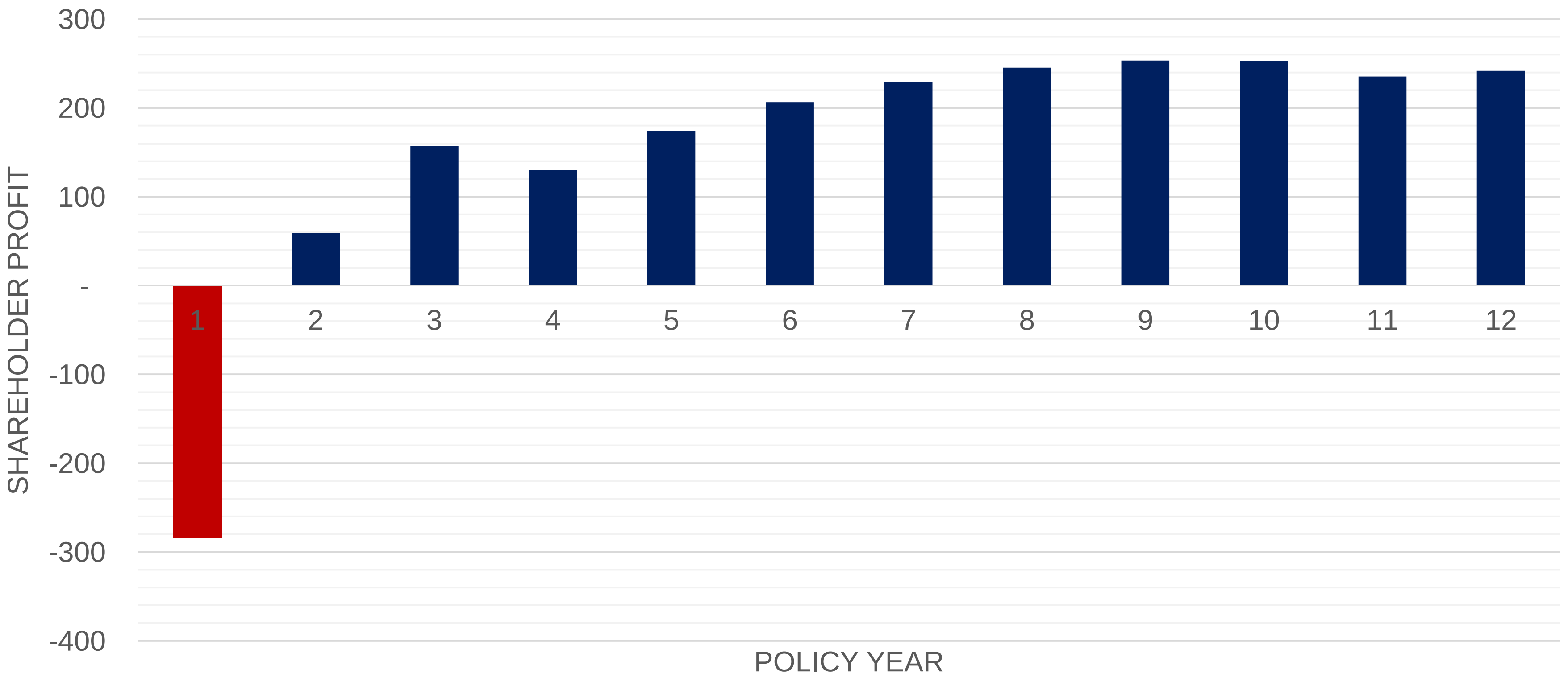
Life Insurance: Snapshot

- Long duration of Contracts, Uncertain Payments to Policyholders ("if", "when" & "how much")
- Presence of guarantees (Death, maturity, surrender and guaranteed interest rate)
- Dependence on economic variables such as - Interest Rates, equity returns, Inflation
- Dependence on operating variables - Mortality, Lapse / Surrenders, Expenses
- New Business Strain on sale of new contract
- What is the P&L missing to recognize? - shows a loss when writing lots of profitable new business when in fact value is actually added; shows a gain when policies cancel when value is actually lost
- What is the balance sheet missing to recognize? - difference between market value and book value of assets (Debt); value of margins used in reserves; cost of holding shareholder capital for solvency purposes

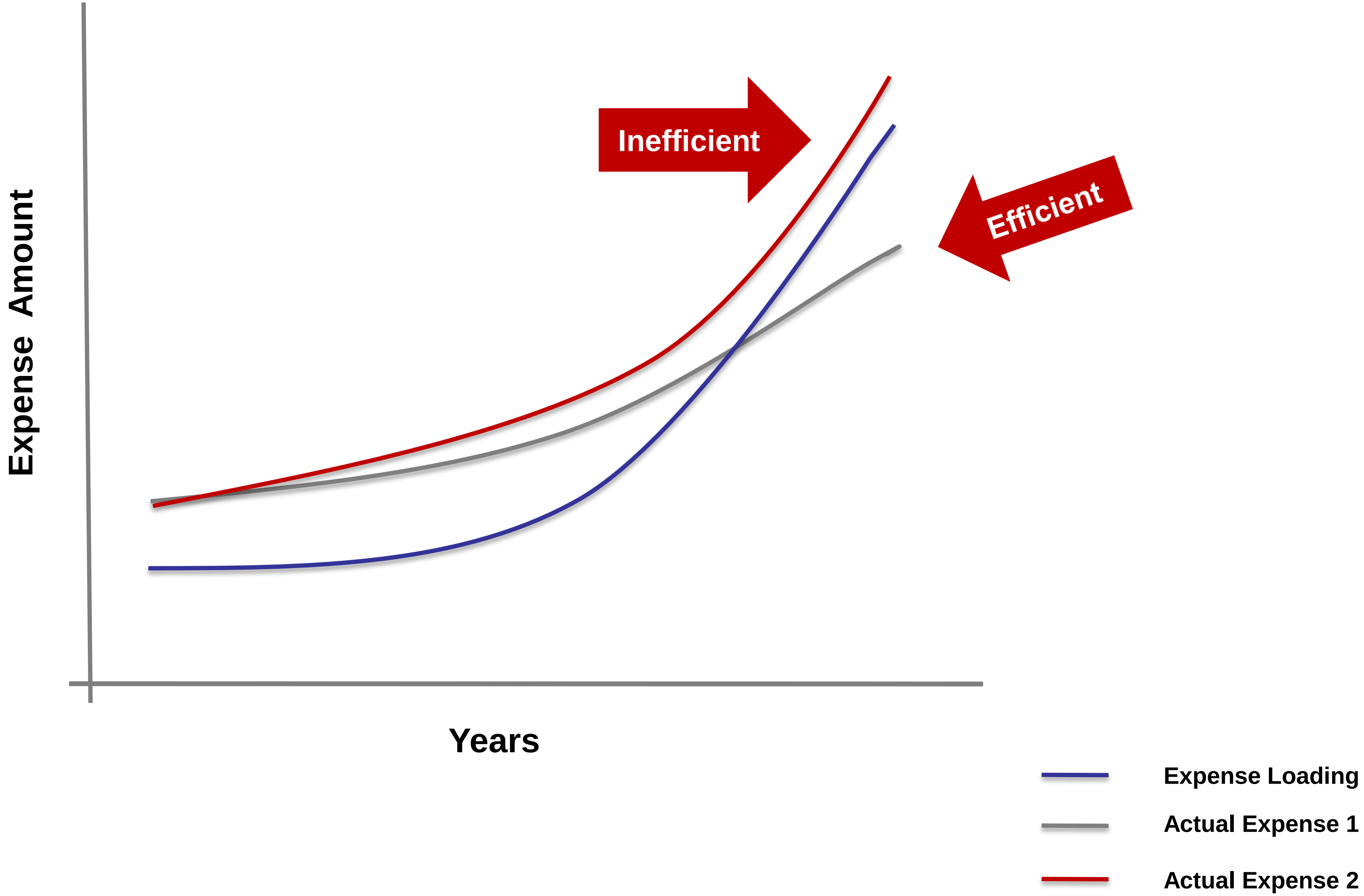
Pricing of Life Insurance Product



Profit Signature - Non-Participating



Projection of profits requires the assumptions for future experience


Inefficient
Efficient
Expense Amount
Years
Expense Loading
Actual Expense 1
Actual Expense 2

Types of Products

- PAR products
  - Non - linked platform
  - Variable Non - linked Insurance products
  - Other than Variable Linked Insurance products

- Non- PAR products
  - Linked platform
    - Variable Linked Insurance products
    - Unit Linked Insurance products (ULIP)
  - Non-linked platform
    - Variable Linked Insurance products
    - Other than Variable Linked Insurance products

- Product categories - Non Participating, Participating and Unit Linked
- Assumptions for Pricing - Pricing Interest Rate, Mortality, Expense, Inflation, Lapse / Surrenders, Bonus Rate
- Profitability and risks differs for each category
- New business strain - to determine capital requirements
- Cost of Reinsurance vs. reduction in risk
- Underwriting costs vs. cost of anti / adverse selection
- Regulatory guidelines

Profitability Measures

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- Mainly two measures of measuring profitability
  - **Profit Margin**:
    It is discounted value of future profits divided by present value of future premiums
  - **New Business Achieved Profits (NBAP) Margin or Value of New Business (VoNB):**
    It is discounted value of future profits divided by annualized premium

- **Profitability depends on types of products**

  For Participating and unit linked products, profitability is lower compared to that for non-par products; commensurate with the risk inherent in the products

  Non-par products have more risks for the shareholders as benefits are guaranteed

Product-wise NBAP

Product Type	Risk level for policyholders	Risk level for shareholders	NBAP Margin for Shareholders	Profit distribution ratio to shareholders
Participating	Moderate	Moderate	3% to 5%	10% of surplus
Non-Linked Non-participating	Negligible	High	25% to 35%	100% of surplus
Unit Linked	High	Low	4% to 6%	100% of surplus

PAR	NON-PAR
Mostly identical products	Differentiated products possible including ULIP and Variable
Discretion in bonus declaration	Usually no discretion
Level of bonus will be a key factor - Investment Performance , Expense Management, Smoothing philosophy	Balancing between - SH Profit, Distributor Remuneration, Customer Return
Reserve increases gradually as bonus vests gradually	Higher initial reserve - higher capital strain
Capital gets locked for long term	Capital intensive product may not be preferable by SH
Distribution of Surplus in 90:10 ratio	Distribution of Surplus in 0:100 ratio
Self sustainable when sufficient estate built-up	Extensive ALM required
Low risk for shareholders - sharing of risk	High investment risk for guarantees at outset

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EMBEDDED VALUE (EV)

- **About EV**
- **EV Factors & Assumption**
- **EV Movement & Sensitivity**

- A common valuation measure used particularly in the life insurance industry
- Embedded Value (EV) represents value of the shareholders' interests in the company
- Appraisal Value = EV + Value of future new business (Goodwill)
- EV Methodologies:
  - Traditional Embedded Value (TEV): VIF + ANW
  - European Embedded Value (EEV): VIF - TVoFG + ANW
  - Market Consistent Embedded Value (MCEV): VIF - TVoFG - CRNHR + ANW
  - In 2013, the Institute of Actuaries of India published APS 10 "Determination of Embedded Value" known as Indian Embedded Value, generally in line with MCEV principles

Where;

VIF: PVFP - COC; PVFP: Present value of Future Profits; CoC: Cost of Capital; TVoFG: Time value of Financial Options & Guarantees; CRNHR: Cost of residual Non- Hedgeable Risk; ANW: Adjusted Net Worth

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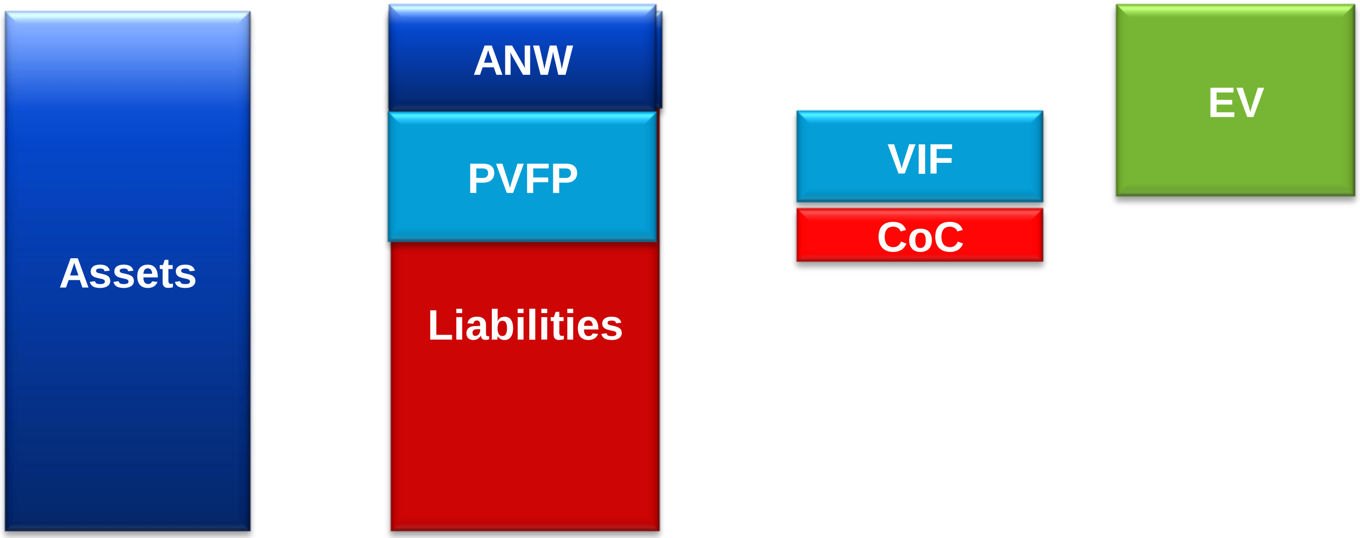
- **Present value, at valuation date, of future profits (after taxes) expected to emerge from all contracts existing at valuation date, taking into account the cost of holding the capital**

- **Present value of Future Profits (PVFP) - Cost of capital (COC)**

$$PVFP = \Sigma_t \frac{P_t}{(1 + r)^t}$$	$$CoC = \Sigma_t \frac{C_{t-1} * [r - i * (1 - tax)]}{(1 + r)^t}$$
Where; P_t = Profit (after tax) i.e future shareholders' transfers r = Risk discount rate	**Where;** C_{t-1} = Solvency capital i = Return on assets backing the capital r = Risk Discount rate

What is Adjusted Net Worth (ANW)

- It is defined as assets (on market value) in excess of what is currently required to meet the statutory liabilities (policy liabilities plus other liabilities).
- Adjusted Net Worth equals the sum of Free Surplus and Required Capital
- 10% of total estate(free assets) in participating fund on market value is also included in ANW
- ANW changes with market movements and business performance.


Assets
ANW
PVFP
Liabilities
VIF
CoC
EV

- Assumptions are determined after carrying out experience analysis having regard to past, current and expected future experience

Assumptions

Economic Assumptions

- Investment return/ fund growth rate
- Inflation
- Allowance for reinvestment risk, investment expenses

Operating Assumptions

- Mortality/morbidity
- Expenses
- Persistency

MORTALITY

- Less than expected deaths lead to
  - Increase in profit and thereby increase in ANW
  - Increase in no. of in force policies and thereby increase in VIF
  - Downward revision (may be) in future mortality assumption there by increase in VIF
  - Overall increase in EV
- And Vice Versa

EXPENSES

- Less than expected expenses lead to
  - Increase in profit and thereby increase in ANW
  - Downward revision (may be) in future expense assumption there by increase in VIF
  - Overall increase in EV
- And Vice Versa

PERSISTENCY

- Impact depends on difference between surrender profit or loss and loss of VIF
- Surrender profit depends on product type, duration of policy and surrender value methodology & parameters
- More than expected surrenders lead to (if surrender profit more than loss in VIF)
  - Increase in profit and thereby increase in ANW
  - VIF decreases due to less no. of in force policies
  - Upward revision(may be) in surrender assumption may increase or decrease VIF (surrender profit differs duration wise)
- However, with more surrenders, expenses will be distributed amongst less no. of policies

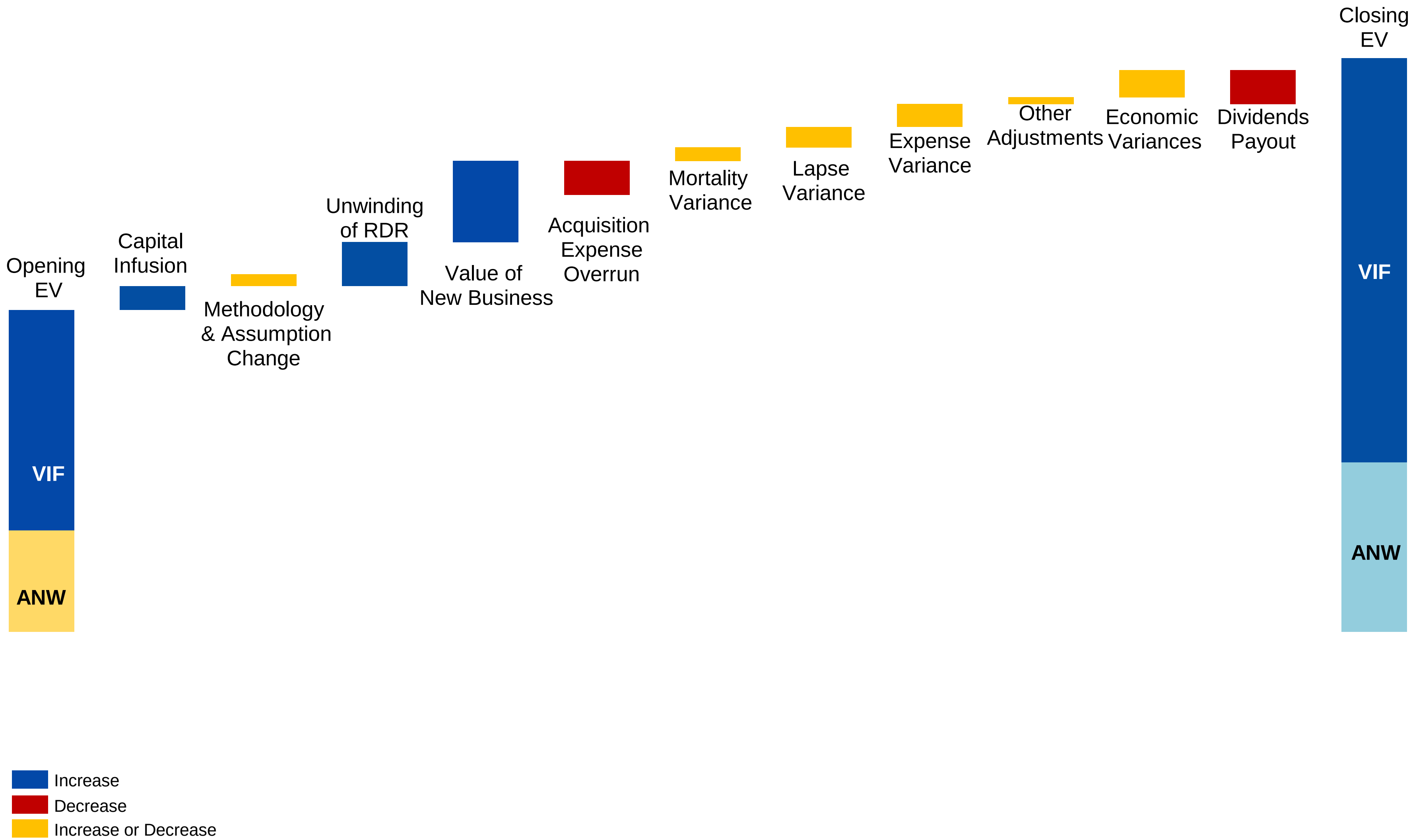
INVESTMENT INCOME

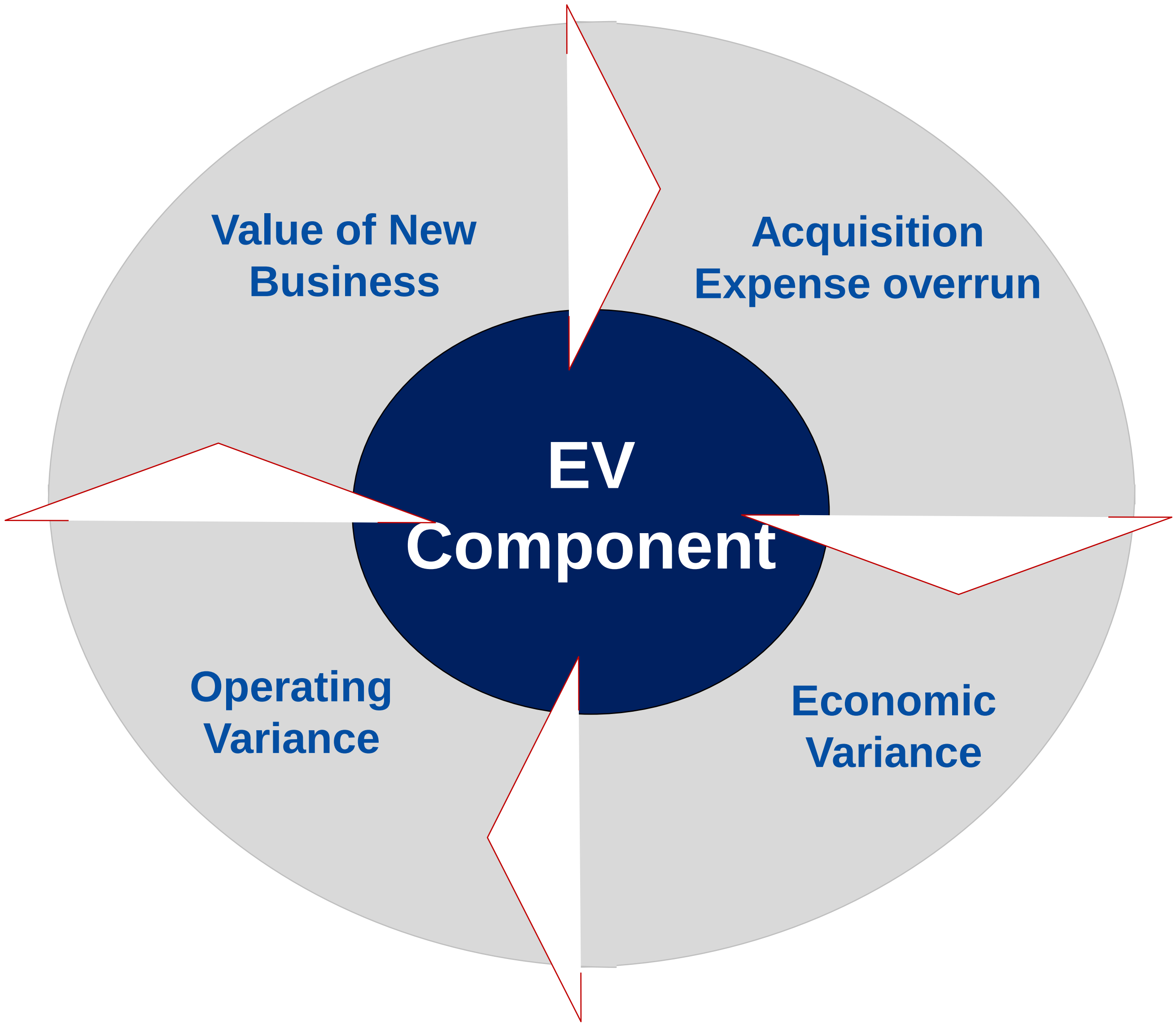
- More than expected investment income lead to
  - Increase in profit and thereby increase in ANW
  - Upward revision (may be) in future investment income assumption thereby increase in VIF
  - Overall increase in EV
- And Vice Versa

CHANGE IN RESERVE

- **Increase in statutory reserves (due to assumption change) lead to**
  - **Deferral in profits**
  - **Increase in VIF**
  - **Decrease in ANW**
  - **Overall impact will depend on RDR and investment income assumption**

WATER FALL CHART




Value of New Business
Acquisition Expense overrun
EV Component
Operating Variance
Economic Variance

Methodologies at a Glance

Item	TEV	EEV	MCEV
PVFP	Projection of future profit using real world investment return, discounted using subjective RDR	Projection of future profit using real world investment return, discounted using risk free rate adjusted with un-accounted risk margin	Projection of future profit using market consistent investment return, discounted using risk free rates
TVOG	Sometimes calculated but no standardized requirement	Mandatory Calculation	Consistent with PVFP methodology
Cost of Capital	Included but no standardized requirement	Mandatory and disclosed	Mandatory split into FCoC and CRNHR
Discount Rate	Risk free rate plus margin or portfolio investment return plus margin	Two approaches – Top down and bottom up	Bottom up approach mandatory
Expenses	No standardization but typically based on historical and expected ongoing experience.	Expenses must reflect expected ongoing operating expenses,	Same as EEV , with additional guidelines
Investmen t Returns	Risk Free rate + risk premium approach (different for different asset class)	Risk Neutral approach or Risk free + risk premium approach	Risk Neutral approach

- Growth in EV - a major indicator of company's performance
- Stock price as a multiple of EV - a major indicator of company's future growth prospects
- VNB / EV gives an indication of market growth rate and value creation stage
- EV as a multiple of capital deployed - a major indicator of how effective is shareholder capital utilization
- Effect of change in experience vs. assumptions on future profits can be assessed through sensitivity analysis

Thank you