INSURNACE PRICING & PREMIUM CALCULATION

RATE MAKING / INSURANCE PRICING

- **RATE** is the price <u>Per Unit of Insurance</u>
- Unit of Insurance is based on type of insurance
  - Life Insurance – An amount of Term or Whole Term Policy
  - Property Insurance – Object covered by the policy
  - Liability Insurance – Unit exposed to liability
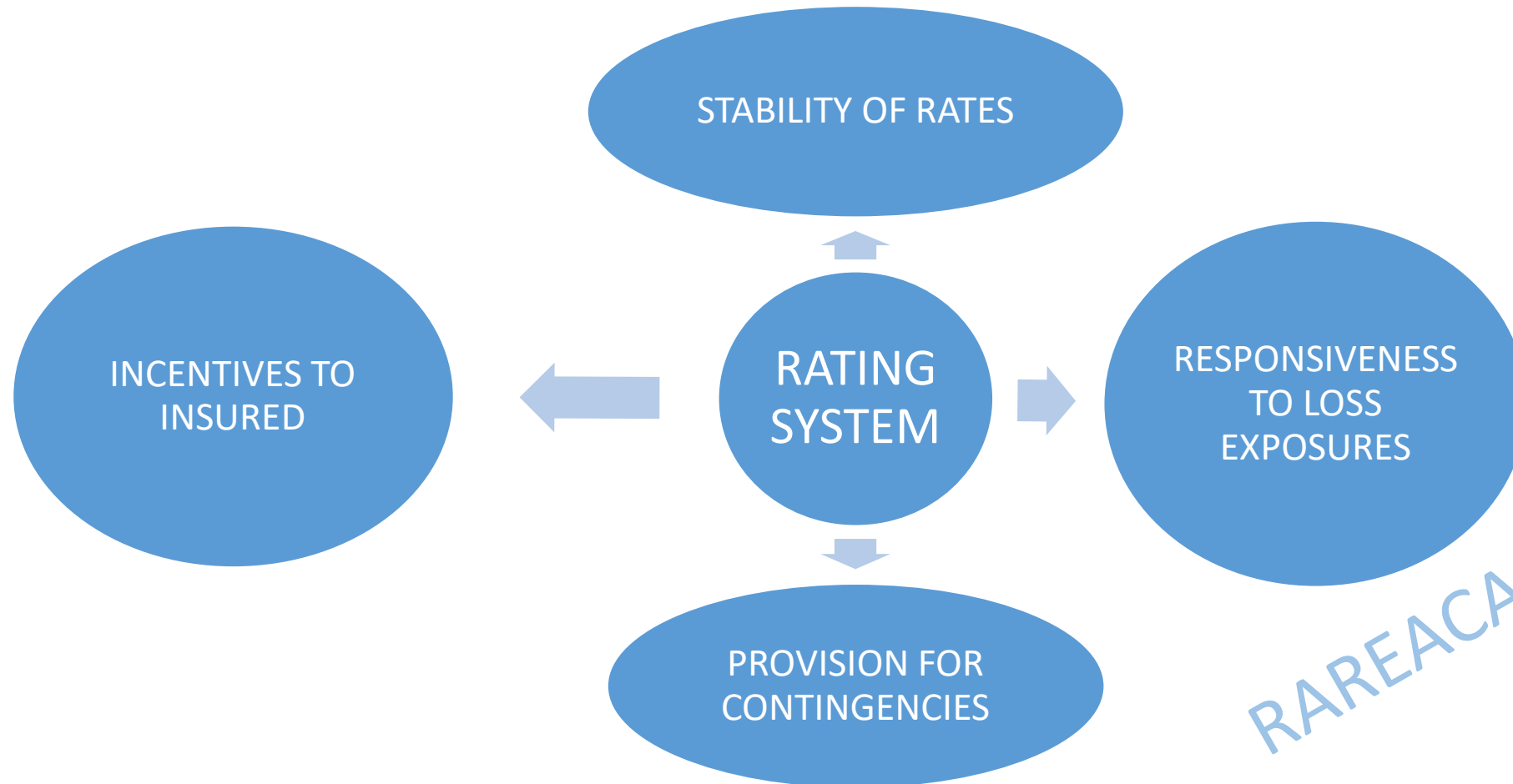 - Health Insurance – An amount of coverage (Eg. Rs.50,000/-)

OBJECTIVE OF RATE MAKING

- ✓ Set the prices of Insurance Products
- ✓ To provide sufficient amount for projected claims based on experience and exposure
- ✓ To fund admin and selling costs
- ✓ To build a margin for adverse deviations
- ✓ To obtain a reasonable profit on the capital employed (RoCE)
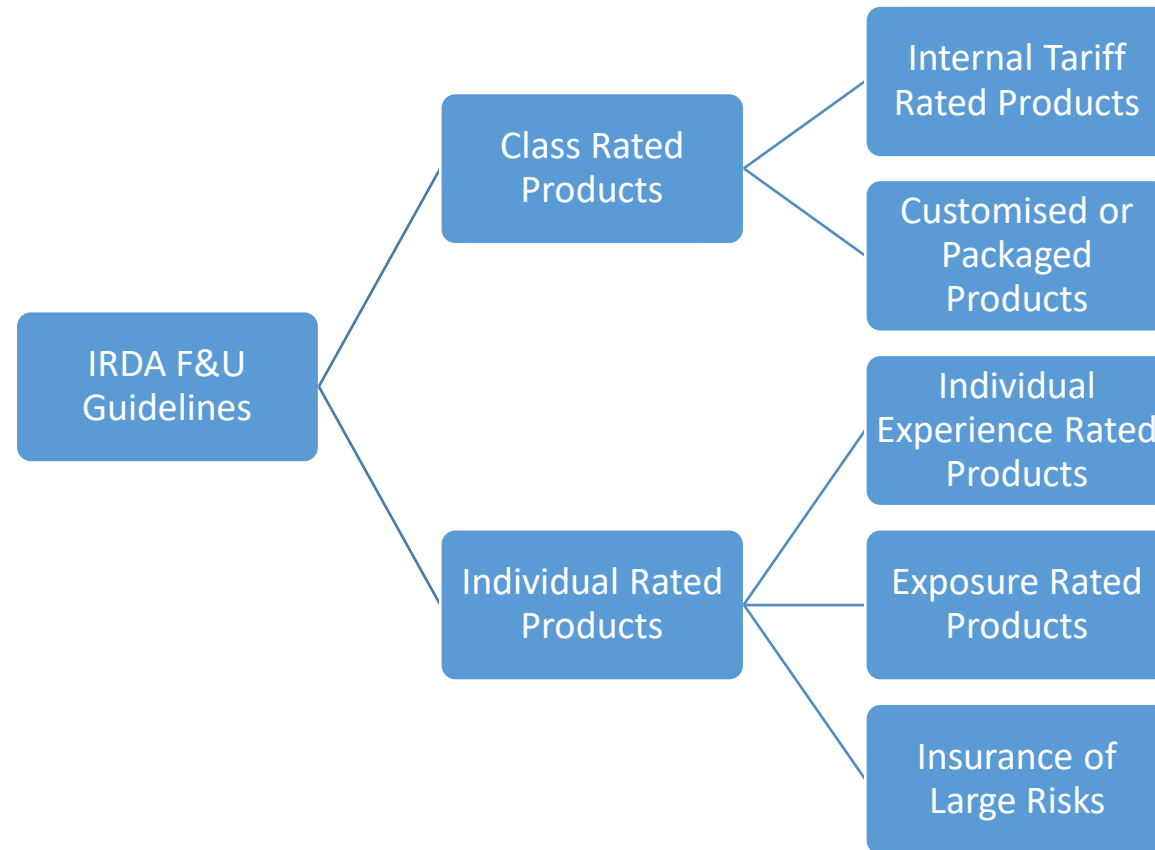
OBJECTIVE OF RATE MAKING

STABILITY OF RATES

INCENTIVES TO INSURED

RATING SYSTEM

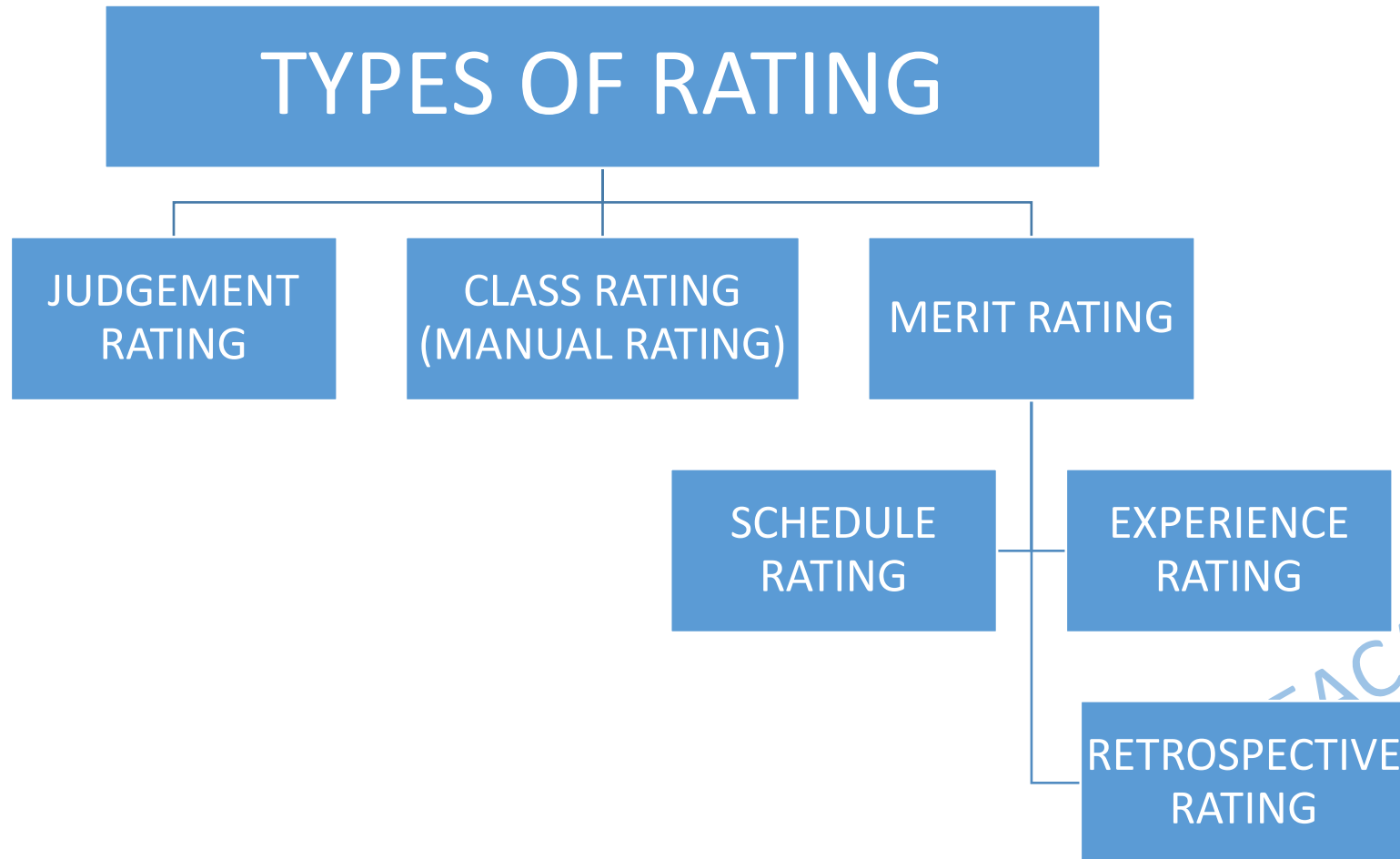RESPONSIVENESS TO LOSS EXPOSURES

PROVISION FOR CONTINGENCIES

OBJECTIVE OF RATE MAKING

➢Rates are subject to Regulatory review.

➢IRDA issues "File and Use" (F&U) Guidelines.

➢Premium Rates should be
  ➢Adequate
  ➢Reasonable
  ➢Fairness
  ➢Simplicity, Consistency & Flexibility
  ➢Encourage Loss Prevention

IRDA F&U GUIDELINES

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                                                    ┌─────────────────────┐
                                                    │   Internal Tariff   │
                                                    │   Rated Products    │
                                   ┌──────────────┐ └─────────────────────┘
                                   │ Class Rated  │
                                   │  Products    │ ┌─────────────────────┐
                                   └──────────────┘ │   Customised or     │
                                                    │     Packaged        │
                                                    │     Products        │
                                                    └─────────────────────┘
               ┌──────────────┐
               │  IRDA F&U    │
               │  Guidelines  │                     ┌─────────────────────┐
               └──────────────┘                     │    Individual       │
                                                    │ Experience Rated    │
                                                    │     Products        │
                                                    └─────────────────────┘
                                   ┌──────────────┐
                                   │ Individual   │ ┌─────────────────────┐
                                   │ Rated        │ │  Exposure Rated     │
                                   │ Products     │ │    Products         │
                                   └──────────────┘ └─────────────────────┘

                                                    ┌─────────────────────┐
                                                    │   Insurance of      │
                                                    │   Large Risks       │
                                                    └─────────────────────┘
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TYPES OF RATING

TYPES OF RATING

JUDGEMENT RATING

CLASS RATING (MANUAL RATING)

MERIT RATING

SCHEDULE RATING

EXPERIENCE RATING

RETROSPECTIVE RATING

TYPES OF RATE MAKING

➢GENERIC RATING - Rating as per Internal Manual or Guidelines of Insurer for Risks of same class or Category

➢INDIVIDUAL RATING - Individual experience based rates or based on analysis of exposure made by the Underwriter

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RATE MAKING ENTITIES

➤Actuaries in Insurance Companies are responsible for Rate Making

➤IRDA (Appointed Actuary) Regulations 2000

➤Actuaries will

  ➤Design Proposal forms

  ➤Determine Reserves for future obligations

  ➤Analyse Earnings & Expenses

  ➤Project Future Claims & Earnings

RATE MAKING PROCESS

➤ Actuaries in Insurance Companies are responsible for Rate Making

➤ IRDA (Appointed Actuary) Regulations 2000

➤ Actuaries will
  ➤ Design Proposal forms
  ➤ Determine Reserves for future obligations
  ➤ Analyse Earnings & Expenses
  ➤ Project Future Claims & Earnings

COMPARISON OF RISK RATING METHODS

PURE PREMIUM METHOD

- Based on Exposure
- Does not require existing rates
- Gives indicated rates

LOSS RATIO METHOD

- Based on Premium
- Requires existing rates
- Gives indicated rate changes

RISK ELEMENTS IN RATE MAKING

PARAMETER RISK

- Risk associated with selection of parameters
- Wrong selection may lead to Over-pricing or Under-pricing

PROCESS RISK

- Risk associated with projection of future contingencies

JUDGEMENT RATING

❖Each exposure is individually evaluated

❖Rate is determined by Underwriter's judgement

❖Applied when

 ❖loss exposures are diverse

 ❖Credible Loss statistics are not available

 ❖When class rate cannot be calculated

 Eg : Ocean Marine Insurance

CLASS RATING

❖Exposures with similar characteristics

❖Rate reflects Average Loss experience for the class

❖Based on assumption that future losses will be determined by same set of factors

❖Advantages
 ❖Simple to apply
 ❖Quick Premium quotes
 ❖Ideal for Personal lines insurance

 Eg : Auto Insurance, Health, Life Insurance, Workmen Compensation etc.

METHODS OF CLASS RATING

PURE PREMIUM METHOD	LOSS RATIO METHOD
• Based on Exposure • Does not require existing rates • Gives indicated rates	• Based on Premium • Requires existing rates • Gives indicated rate changes

RATE MAKING PROCESS

PURE PREMIUM METHOD

PURE PREMIUM = $\frac{L}{V} \ x \ 100$

L is Losses

V is Value

Pure Premium is also called as BURNING COST

PURE PREMIUM

PURE PREMIUM (R) = $\dfrac{P+F}{1-V-Q}$

R = Rate Per unit of Exposure

P = Pure Premium

F = Fixed expense per exposure

V = Variable expense factor

Q = Profit and Contingencies factor

PURE PREMIUM (ALTERNATE)

$$\text{Pure Premium} = \frac{Incurred\ Losses\ and\ Loss\ Adjustment\ Expenses}{Number\ of\ Exposure\ Units}$$

$$\text{Gross Rate} = \frac{Pure\ Premium}{1 - Expense\ Ratio}$$

Gross Premium = Pure Premium + Load

RATE MAKING PROCESS

Loss Ratio Method indicate Rate Changes. Actual Loss Ratio will be compared with Expected Loss Ratio

Indicated Rate (R) = A x Ro

R = Indicated Rate

Ro = Current Rate

A = Adjustment Factor $(\dfrac{Experience\ Loss\ Ratio(W)}{(Target\ Loss\ Ratio)(T)})$

LOSS RATIO METHOD

RATE CHANGE $= \dfrac{A-E}{E}$

A = Actual Loss Ratio

E = Expected Loss Ratio

TARGET LOSS RATIO

TARGET LOSS RATIO (T) = $\frac{1-V-Q}{1+G}$

G = Ratio for Non-premium related to expenses

Q = Profit and Contingencies factor

V = Premium related expense factor

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EXPERIENCE LOSS RATIO

EXPERIENCE LOSS RATIO (W) = $\dfrac{L}{E\,Ro}$

L = Experience Losses

E = Experienced period earned exposure

Ro = Current Rate

MERIT RATING

Class Rates are adjusted upward or downward based on individual loss experience.

Merit Rating is THREE Types
- ➢Schedule Rating
- ➢Experience Rating
- ➢Retrospective Rating

EXPERIENCE RATING

➢Each exposure is individually rated

➢A basis rate is determined for each exposure

➢Determined exposure is modified by debiting or crediting undesirable or desirable physical features.

INDIVIDUAL RISK RATING

PROSPECTIVE SYSTEMS -   Use past experience to determine costs of coverage for future

RETROSPECTIVE SYSTEMS - Use actual experience of the period to determine final cost of that period.

EXPERIENCE RATING – All large individual risk rating is a form of experience rating. It reflects the entity's actual experience.

BASIS OF RATE MAKING

LIFE INSURANCE	NON-LIFE INSURANCE
• MORTALITY • EXPENSES • RATE OF INTEREST	• CLAIMS COST • BUSINESS ACQUITION COSTS • MARGIN FOR FLUCTUATIONS • PROFIT • MANAGEMENT EXPENSES

RATE MAKING IN LIFE INSURANCE

➢Actuaries will use Mortality Table or Individual Company experience to determine the probability of death at each age.

➢The annual expected value of death claims equals the probability of death times the amount insurer must pay if death occurs i.e. Probability of Death X Amount of Claim

MORTALITY TABLE

➢Actuaries will use Mortality Table or Individual Company experience to determine the probability of death at each age.

➢The annual expected value of death claims equals the probability of death times the amount insurer must pay if death occurs i.e. Probability of Death X Amount of Claim

WORKING OF PREMIUM

WORKING OF LIFE INSURANCE PREMIUM FOR AGE GROUP 05-35 PER SUM ASSURED Rs. 1,00,000/-	
Heart Attack incidence	150
Cancer incidence	40
Blindness incidence	10
Liver & Kidney Transplantation incidence	50
HIV incidence	20
TOTAL	**270**
Total Claims Incidence Rate	0.0027
Marketing Expenses	20%
Profit Margin	10%
Administration	20%
Technical Rate	0.0027/0.50 = 0.0054
Technical Premium for SA Rs. 1,00,000/-	Rs. 540/-
Loading for Age Group of 30 – 35 @ 20%	Rs. 108/-
Total Premium Payable	Rs. 648/-

RATE MAKING IN GENERAL INSURANCE

➢Claim and Exposure experience will be taken into consideration.

➢Expenses will be provisioned

➢Reasonable Profit will be incorporated