Pricing – Health Insurance Products

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Milestones

- **Overview of Health Insurance Products**
- Pricing Fundamentals
- Models
- Derivation of Premium
- Challenges in Pricing

Health Insurance Products

- **Classification – Based on Payout**
  - Indemnity
  - Fixed benefit
- **Classification – Segment**
  - Retail
  - Group
    - Employer- Employee
    - Other Groups

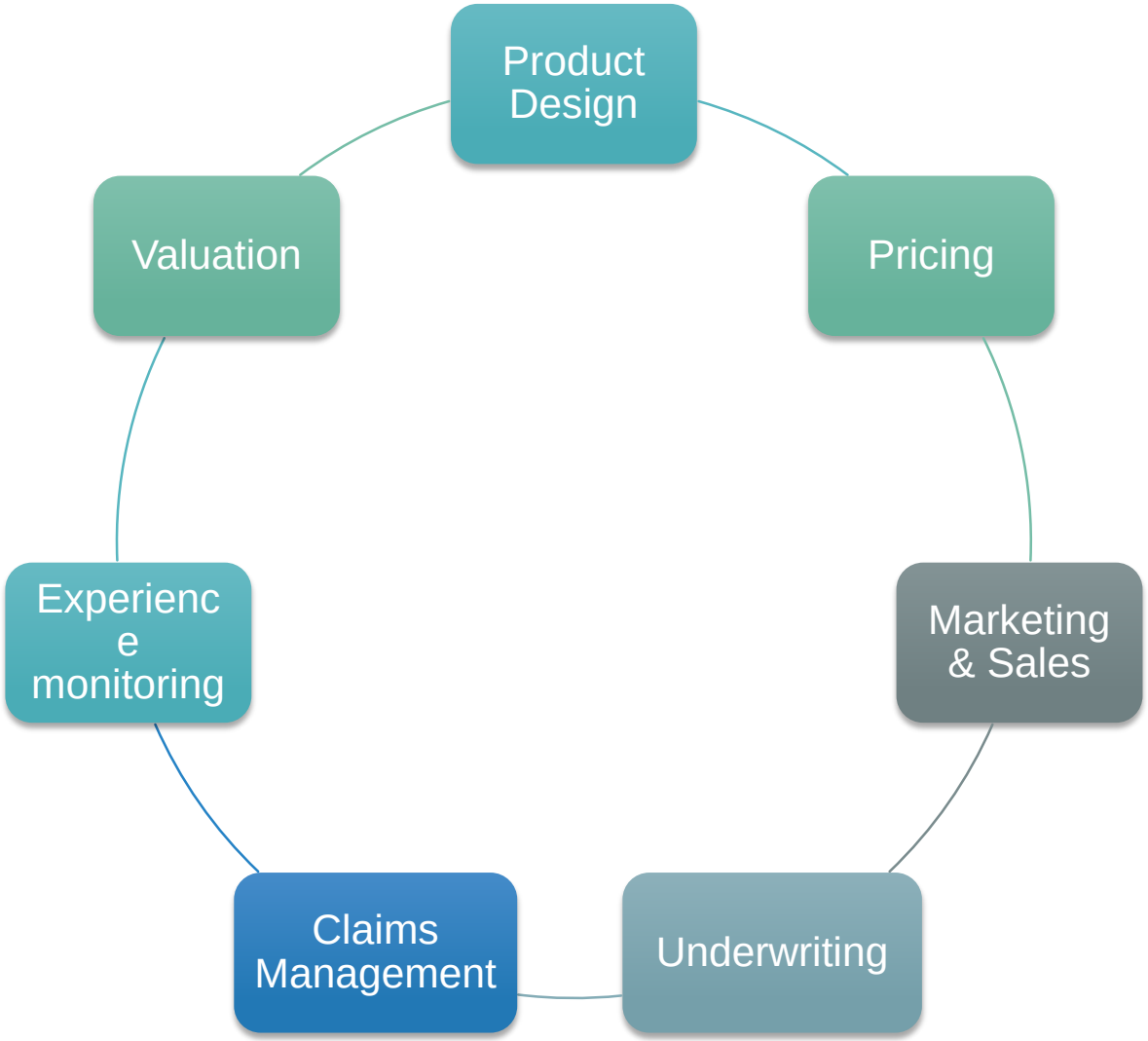
Indemnity Based Products

- **Indemnity**
  - An **indemnity plan** is a health insurance **plan** that reimburses the covered person for incurred medical expenses.
  - **Indemnity plans** may include a deductible that must be satisfied before claims can be paid.
  - Examples
    - Retail Health Insurance
    - Group Health Insurance Products

Fixed Benefit Based Products

- **Fixed Benefit**
  - Lump sum is paid under the policy on occurrence of covered perils
  - No deduction/ deductible in claims payment
  - Examples
    - Personal Accident
    - Critical Illness
    - Hospital Cash

Product Control Cycle



IT Support

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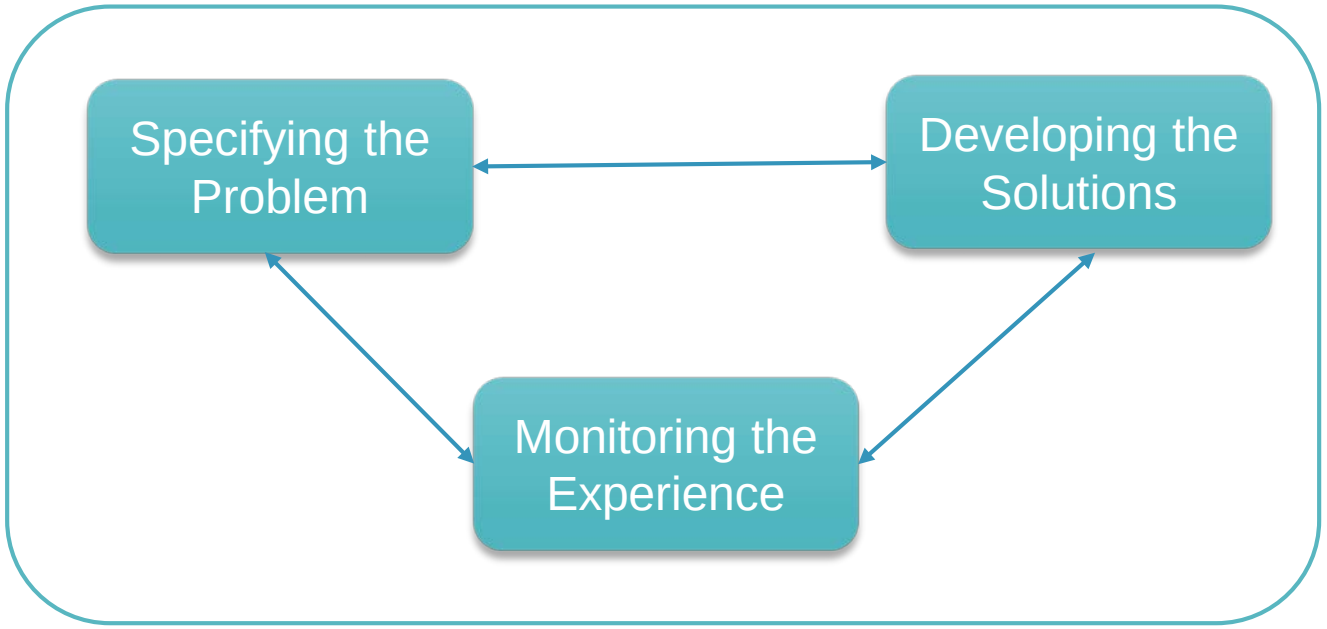
Actuarial Control Cycle

The General Commercial and Economic Environment

- Health Insurance Products
- Stakeholders (internal, External)
- General Environment
- Regulations



- Modelling
- Data
- Assumptions
- Pricing
- Reserving
- Investment

- Risk & Risk Management
- Contract Design

Professionalism

- Monitoring and feedback
- Professionalism

Insurable Risk

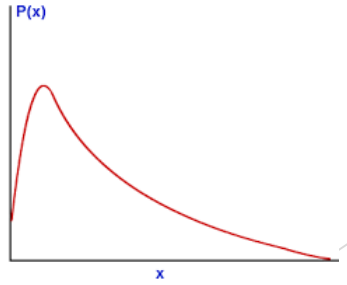
❑ Insurable Risk

- ➢ Policyholder must have an interest in the risk being insured, to distinguish between insurance and a wager
- ➢ A risk must be of a financial and reasonably quantifiable nature (e.g. an accident)
- ➢ Amount payable by the insurance policy (e.g. INR 5 Lakh for the accident)

Father insuring his family vs his neighbor (who is unrelated)

❑ Criteria for an insurable risk

- ➢ Financial/Quantifiable
- ➢ Interest in risk being insured
- ➢ Amount payable relates to size of loss
  Moral hazard eliminated
- ➢ Data available on risks
- ➢ Pooling of large number of similar risks
- ➢ Independence



Pricing Objectives

- **Adequacy**
  - The payments generated by a block of policies plus any investment return on same as relevant must be sufficient to cover the current and future benefits and costs

- **Equity**
  - This equity refers to setting premiums commensurate with the expected losses and expenses; it also suggests no cross subsidization. The equity notion sets a floor.

- **Not excessive**
  - The excessive notion sets a ceiling
  - Regulation
  - Competition

TCF: Treating Customer Fairly

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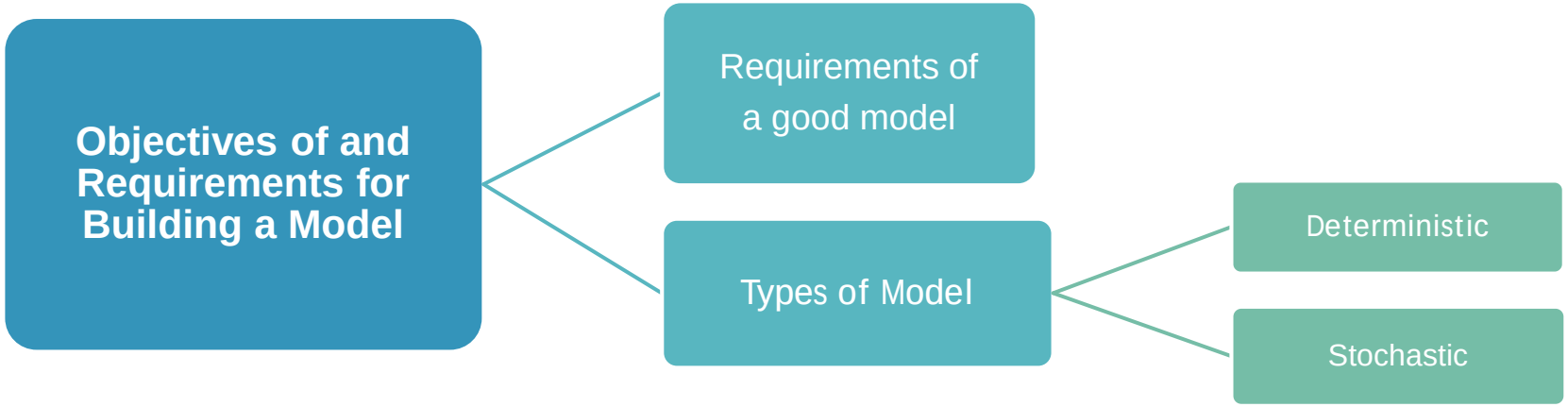
Modeling


Objectives of and Requirements for Building a Model
Requirements of a good model
Types of Model
Deterministic
Stochastic

Requirements of a good modeling

- Adequately documented
- All significant features allowed for
- Developable
- Valid
- Inputs to parameter values appropriate
- Sensible joint behaviour of variables
- Output and workings are communicable

Deterministic vs Stochastic

- Deterministic:
  - The output of the model is fully determined by the parameter values and the initial conditions.

Deterministic models:

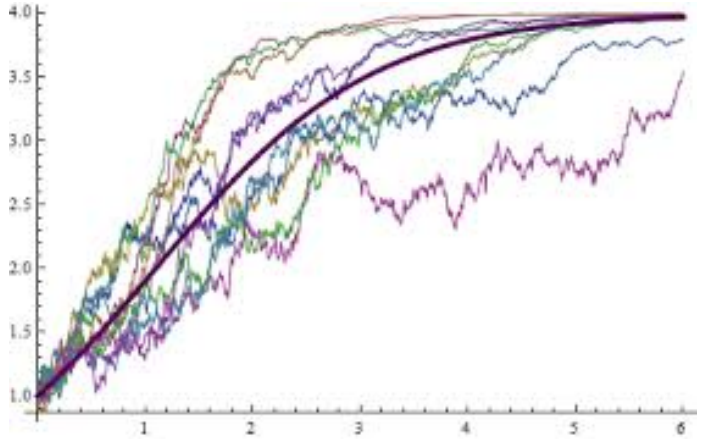
- Quicker/easier to design, build and run
- Clearer what scenarios have been tested
- Results are easier to explain
- Less risk of model and parameter error

Deterministic vs Stochastic

- Stochastic:
  - Models possess some inherent randomness.
  - The same set of parameter values and initial conditions will lead to an ensemble of different outputs.

Stochastic models:

- Allow explicitly for "real world" uncertainty of outcomes
- Allows for correlations between variables
- Test a wide range of scenarios
- Good for identifying extreme outcomes
- Good for assessing cost of guarantees and options



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Pricing - Importance of Data

"Garbage in garbage out"

Data Sources	• Relevant • Credible • Updated
Data Capture	• Underwriting - Proposal form : Ease vs Amount of information • Claims - TPA/Hospitals • Standardisation • Systems Integration
Data quality	• Gradually Improving • Checks – eg: premiums and claims linkages • Audits
Data protection and disclosures	• Privacy issues

Data Sources

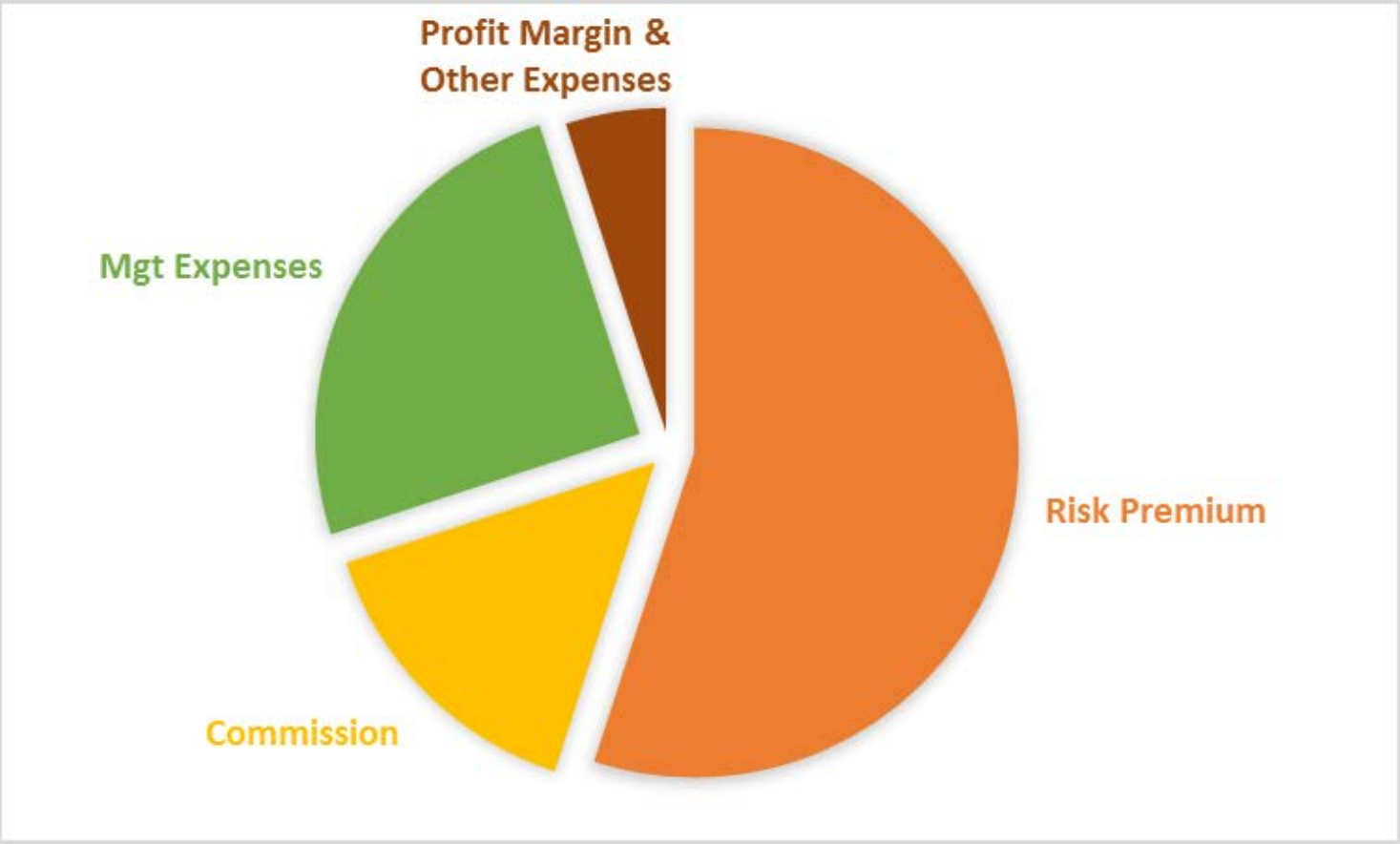
- Experience investigation on existing portfolio
  - Membership data
  - Claims data
- National statistics
- Industry Data: IRDAI, IIB
- Regulatory reports
- Data from reinsurer
- Data from foreign JV partner
- Data from Actuarial consultancy firms
- Secondary research: Reports published by
    - Government agency
    - NSSO
    - Research agency
    - Website

Data Checks

- Reconciliation checks
- Reasonableness checks
- Spot checks
- Cross checks

Premium Breakup

Gross Premium



Risk Premium : Cost of Claims per exposure (Life Year)

Risk Premium (Burning Cost) = Claim Frequency * Average Severity

Claim Frequency : Number of Claims / Earned Lives
Average Severity : Amount of Claims / Number of Claims

Risk Premium : Amount of Claims / Earned Lives

Risk Factors :

Factors which effect the Claim frequency or Severity

- Age
- Sum Insured
- Demography
- Medical Condition
- Gender
- Policy Type

Factors which are used in Rating are called Rating Factors

Expenses

❑ Allocation of Expense for premium rating

- ➢ Fixed amount per contract e.g. administration expenses
- ➢ % of premium e.g. commission
- ➢ % commission e.g. sales and marketing expenses
- ➢ % of benefit e.g. underwriting expenses
- ➢ % of funds under management e.g. investment expenses
- ➢ Combination of above

Worked Example

Profit Testing

- **Profit testing models can be used to estimate the results of providing the product under different scenarios:**
  - Profit gross of tax =
  - (+) Premiums
  - (+) Investment income
  - (-) Expenses
  - (-) Benefit pay-outs (claims, maturity, surrender values)
  - (-) increase in reserves

Sensitivity Analysis

- Sensitivity analysis for each key parameters
- To check:
  - Model Error
  - Parameter Error
  - Allowing for risk in a model
  - Variability of experience
  - Reasonableness of output
- Results of analysis can help in assessing the margins to be incorporated into the parameter values

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Anti-selection (and Moral hazard)

Anti-selection

- A high-risk which satisfies a lower risk group's entry rules exploits the cheaper price. Caused by faulty rating structure and poor risk selection. "Asymmetric knowledge"

Moral hazard

- Behavioural change after joining the risk group. Increased propensity to claim

Examples

Pre-underwritten plans up to age 45 years

- Customers anticipating higher medical expenses in near future more likely to purchase private health insurance
- Customers expecting higher utilisation opt-up the benefits scale

Group plans purchased by employers for all employees

- Employee's dependents covered
- Employee has the option to add parents in the scheme

Renewals

- **Selective Lapsing and Guaranteed Renewability**
- **Portfolio Ageing**
- **High Increase in premiums leads to high Selective lapsing**
- **Medical Inflation**

Risk Control

Important to have enterprise-wide risk control approach to address issues arising out of anti-selection, pricing and product innovation

Board level

- Board and Senior Executive to ‘set the tone at the top’
- Effective systems to capture, store, analyze and utilize risk information
- Internal communication systems
- Access to appropriate risk management skills and knowledge
- Periodic review of the ERM framework to ensure continuing viability

Policy terms & conditions

- Mandating customer participation in claims cost - deductibles, co-payment etc.
- Annual aggregate limits or claim-wise sub-limits on the cover provided
- Requiring authorization prior to non-emergency related treatment

Risk Control

Underwriting processes

- Consider claims trends or uncommon spikes in utilization at the time of issuance/ renewal
- Modifying policy terms upon renewal – exclusion of hospitals/ treatments, deductibles etc.
- For Group policies, share periodic reports on utilisation with clients with suggestions to address claims costs

Claim processes

- Vertical integration for greater claims control
- Audit for fraud control or operational control

Capital management

- Sufficient capital to meet the liabilities
- Economic capital allocated to the insurance class

Thank You!