Institute of Actuaries of India

Subject ST1 – Health and Care Insurance

September 2017 Examination

INDICATIVE SOLUTION

Solution 1:

i)

- Improving the pricing basis based on actual experience
- Revising or setting reserving basis
- Improving the marketing message as a result of poor new business volume from a particular product
- Revising sales procedures in terms of training and selection of distributors, wording and format of literature and mechanics of commission clawbacks
- Providing and deciding on adequacy of staff
- Revising underwriting process to ensure pricing basis is reflected in reality
- Revising claims handling process

(2)

ii)

PMI experience should be investigated by incidence rate and claim cost.

For incidence rates - the exposed to risk and number of claims considered should be consistent in respect of time period and classified by:

- Sales channel
- Service provider
- Policy benefit section
- Age
- Gender
- Occupation
- Location of residence
- In force duration
- NCD level
- Excess levels
- Underwriting method

This data can be further sub-classified, depending on available data, by-

- Inpatient, day care or outpatient
- Type of hospital or band

Incidence rate can then be calculated and actual by expected (A/E) comparison can be made for above classifications and a combined aggregate number.

In determining the A/E ratio, one should allow for possible delay in claims reporting or settlement within the investigation period. The claims incidence rates should be adjusted accordingly.

For claim costs, we need to examine experience broken down into suitable categories. The costs of all major diseases and procedures will be examined separately. Particular focus should be on

whether new procedures, drugs or equipment were being used to treat the disease or not. For each category, average claim cost can be computed

The Company may also decide to monitor the early claims, non-disclosure and anti-selection trends separately so that appropriate actions can be taken.

Comparisons can be made with external PMI experience for confirming the validity of the results.

(5)

iii)

How to derive risk rates of Critical Illness products using hospital data and PMI experience.

Data should be divided into the basic diseases covered in the product

Lives exposed need to be estimated. This would be difficult to estimate in case of hospital statistics but can be estimated based on the scope and purpose of the data collected. In most cases it would be ideal to use the population statistics as a whole unless data has been collected from hospitals in particular locations only. Data of exposure in respect of PMI can also be compared with hospital data for PMI to understand the relevance of hospital data.

A “first-ever” adjustment needs to be made since mostly critical illness products only pay on the first occurrence of an illness. Thus, this adjustment reduces the incidence rate for pricing purposes.

It is also necessary to account for overlaps between conditions and diseases.

An adjustment from general population data to the insured population is necessary due to the effect of underwriting. Also, the insured population is generally wealthier and healthier than the general population. This would tend to decrease incidence rates.

However, consideration must also be given to possible anti-selection.

Finally, it is necessary to adjust for various contractual terms and conditions, such as the discrepancy between the insured definition of illness and the clinical definition of illness.

Since a critical illness is only paid in the event the insured survives 30 or 60 days (in most products), the incidence rate would then be reduced for deaths occurring within this Survival Period.

Medical and morbidity trending is necessary to account for medical advances since the date of exposure from which statistics were derived.

Various other adjustments may be made, such adding margins for rate guarantees.

Once the data has been adjusted and corrected, incidence rates for each disease can be calculated based on exposure at start of the period and number of incidence during the year.

(3)

[10 marks]

Solution 2:

i)

Anti-selection:

Insurer will be exposed to selection risk. Pricing of the proposed group policy is most likely to be higher than that of the retail product in lieu of the waiting period waiver and medical test requirement change. On average, healthier risks, will apply for retail product due to price differentials. Customers, who have higher propensity to claim, will opt for the proposed group policy.

Lapse & re-entry risk in retail policy:

Those Bank customers who have recently purchased the retail policy (subject to waiting period restriction) and who are in poor health, may lapse their retail policy and opt for the group policy. It compounds the selection risk.

Due to this kind of selective lapsing, the Insurer may not recoup some of the initial expenses which are spread over many policy years in pricing assumptions of the retail product.

Pricing assumption and data risk:

Proposition is voluntary with pre-existing diseases being covered from day one and mandatory pre-acceptance medical test requirement kicking in for higher ages and amounts. Insurer may not have experience of such kinds of portfolios. Pricing assumptions are associated with high level of uncertainty and risks.

High contingency margin in pricing due to above factors may lead to an unattractive proposition to the members. Moreover, there is a high chance of difference between actual and expected experience

Volume risk:

Higher contingency margin in pricing may lead to only unhealthy lives opting for the policy. Actual volume could be much smaller than assumed at the outset. Pricing assumptions may not hold true in such scenario.

The attractive propositions of waiting period waiver and higher age and amount of pre-acceptance medical check, may lead to a higher volume than expected. This may put administrative pressure on the insurer.

Expense risk:

Lower volume may lead to insurer not being able to recoup its initial fixed expenses like system development cost, training cost and marketing cost.

Higher than expected volume may increase the administration cost, e.g. recruitment of additional man-power

There is a general risk that actual expenses are higher than assumed in the pricing.

Miss-selling/policy disclosure risk:

Applicants may not be explained properly the need of true disclosure in the proposal form. It may be intended to avoid the hassle of pre-acceptance medical test and risk of losing business.

Insurer loses the right of underwriting an application, which might have been declined due to health condition or otherwise priced accordingly.

Reputation risk:

If claims are repudiated due to non-disclosure of material fact in the proposal form, customers may complain of mis-selling. It may lead to bad publicity.

It may also strain the relationship between Insurer and bank.

Competition risk:

Need to find out if there is any other insurance company in the competition.

Need to consider the pricing of the competitor while quoting.

Capital consideration:

If the potential volume is very large, it becomes important to assess the capital requirement and solvency position of the company

(8)

ii)

Anti-Selection:

- Offer the Group policy to a particular segment of Bank customers only (e.g. loanee profiles). This would not give an opportunity to healthy lives in that segment to opt for retail and bad lives to opt for Group policy.

- Only offer the Group policy going forward (stop selling the retail PMI policy).

- Reduce the contingency margin in the pricing. Try to make the price of the group policy in line with retail product offered by the company. This will remove the price differential thereby addressing selection risk and ensure a large portfolio which is expected to be a mix of good and bad risks.

- Train the Bank employees (who will be responsible to present the Group policy to customer) to ensure that customers are guided and encouraged to disclose any past medical history in the proposal form.

- require a minimum take up rate commitment from the Bank

Lapse & re-entry risk in retail policy:

- Make an internal process where retail customers (customers of bank who have purchased retail insurance policy) can participate in the group policy only at renewal. Give them a time window during renewal of retail policy, beyond which they will not be able to convert to the group policy.

- Make those cases subject to medical underwriting (at least a tele-underwriting) or take a good health declaration from the customers.

Pricing assumption and data risk:

- Take reference from claim experience of Group policy (employer's employee) of other companies, industry or country where pre existing diseases are generally covered from day one and Medical underwriting requirement is very rare.

- Spread the initial expenses over the expected number of insurance policies to be sold / renewed in next three years (say). This will reduce the expense margin in premium, hence a more competitive premium.

- Get into a multi-year contract (minimum three years) with the bank.

- Monitor the portfolio at regular interval and take corrective actions as and when necessary instead of putting additional contingency margin in pricing.

- a Quota share reinsurance arrangement will help the company to spread the risk and increase Company's underwriting capacity.

- Reinsurer may also provide technical support in pricing, which may lower the need of putting contingency margin in pricing.

Volume risk:

- Discuss with the Bank management and come up with the right marketing and selling strategy.

- Prepare a proper business plan and get buy in from the Bank management.

- Put a maximum cap on business volume.

- Do a monthly monitoring of the business progress

- Get a minimum commitment in terms of number of lives from Bank over the next one year.

Expense risk:

- Address the volume risk to counter the expense risk.

- Monitor the on-going expenses at monthly level.

- Outsource some of the non-core activities with pre-agreed cost structure.

Capital consideration:

- If the potential volume is very large relative to size of the company, the Board needs to be sensitized about the possible course of action, especially the need of additional capital infusion. Capital commitment from shareholders will be required before taking the final decision.

- Apart from reducing pricing risk, proportional reinsurance may be helpful here to reduce the capital requirement.

(8)

[16 marks]

Solution 3:

i)

Ages 16-24

May be in higher education, first job and possibly not married

Financial needs – May still have parents' support but might be saving towards a goal like paying off student loan

Health needs – Likely to be in good health but may need covers for injuries or accidents

Little need for health products especially if working and employer is providing health benefits. May need accidental tpd or personal accident cover

Ages 25-34

May have dependants, loan liability possible due to home purchase, moderate income but not much wealth

Financial needs – Loans to pay off and income to meet dependants' needs

Health needs – Likely to be in good health but may be worried about possible ill-health in future due to family history or dependants

Main need is for IP and CI to ensure liabilities and dependants' needs are met in case off ill-health

Ages 35-59

May not have dependants, loan liability paid off, periods of redundancy may happen

Financial needs – saving for retirement

Health needs – May be worried about CI and long term illness, may wish for quicker and luxury healthcare

Need is for all health and care insurance products

Ages above 60

Moving to retirement

Financial needs – Lower income but more wealth

Health needs – Need for long term care

Main need is for LTCI. May also go for PMI.

(6)

ii)

Risks:

• Medical inflation is uncertain to predict even if historical data is available.

• Lack of control over the costs charged by medical providers

• Changes in utilization due to medical progress. Eg.day care surgeries might be conducted without overnight stay-in treated.

• Changes in utilization pattern due to new diseases.

• Changes in utilization pattern due to changes in legislation, public health coverage, and provider supervision

• Change in utilization due to anti-selective lapse.

These may lead to higher than expected incidence and claim amount

(6)

iii)

Challenges-

- Delay in getting the response, claims history etc. from the previous insurer

- There might be system complications since portability applicable only to Sum insured under previous policy. Hence, waiting periods for certain covers waived off but only up to certain amount.

- This will also result in underwriting complications. It makes it unclear as to what Sum Insured should be considered for underwriting when looking into the underwriting grid of the porting Insurer.

- There would be a cost of porting but this cannot be charged to the policyholder

- Lack of policyholder knowledge in understanding the complex regulations around different waiting periods leading to customer dissatisfaction.

- Portability can lead to selective lapsing. If the average experience for a portfolio has been poor that warrants a premium increase, healthy lives may leave the policy and port out without losing accrued benefits.

- Pricing Challenges – Cannot price differently for porting policies and newly issued policies even though the expected morbidity experience will be different due to waiting period, selection effect etc.

- The renewals may be impacted due to portability as a result of which it may be difficult to project renewal assumptions.

- Initial expenses might not be recouped for policies porting out early.

Ways to manage these –

- Delay in getting the response, claims history etc. from the previous insurer

This issue should be addressed in industry wide meeting as it is a common issue for all insurers.

- There might be system complications since portability applicable only to Sum insured under previous policy. Hence, waiting periods for certain covers waived off but only up to certain amount.

System development could be outsourced

- **This will also result in underwriting complications. It makes it unclear as to what Sum Insured should be considered for underwriting when looking into the underwriting grid of the porting Insurer.**

Use industry wise standardised grid or make a formula applicable for each ported policy for consistency

- There would be a cost or porting but the same cannot be charged to the policyholder

This should be covered at time of original pricing

- Lack of policyholder knowledge in understanding the complex regulations around different waiting periods leading to customer dissatisfaction.

Good marketing and sales process should be encourage for customer education

- **Portability can lead to selective lapsing. If the average experience for a portfolio has been poor that warrants a premium increase, healthy lives may leave the policy and port out without losing accrued benefits.**

This should be priced

- The renewals may be impacted due to portability as a result of which it may be difficult to project renewal assumptions.

Uncertainty should be priced through higher contingency margin. Actual experience in other countries can also be considered but might not relevant.

- Initial expenses might not be recouped for policies porting out early.

Spread period should be lower **(6)**

iv)

Cost of providing a free health check up would be cost of medical checkup* number of people staying till 5th renewal and opting for checkup – notional impact on profitability due to below changes in each component

Morbidity Experience - It is expected that the free health check-ups are expected to provide additional health information. Through effective use of this information, the insurer may be able to manage its morbidity experience well.

Incidence rates - Higher incidence rates as a result of detection which otherwise could been missed.

However, lower per claim cost as diagnosed early and hence, treated faster.

Expenses - Expenses for check-up have to be met but cannot be charged to the policy holder.

At the same time, this may lead to higher sales and hence lower per policy fixed costs.

Lapses - Lower lapses at early durations as there is an incentive to renew now.

There may be increased lapses after the 5th policy renewal

However, aging of the portfolio could increase claims.

Hence, need to balance with good NB volumes by selling to younger population.

Investment Income - Increased sales, bigger pool for investment,

more economies of scale and increased risk taking capability possibly leading to higher returns.

New Business: Expected to increase as long as premiums continue to be competitive.

(6)

[24 marks]

Solution 4:

i) (

The possible reasons behind the suggestion made by the administrative trust could be as follows:

- The current premium level might not be sufficient to cover the cost of cover, due to:
    - Ageing population
    - Increase in the awareness
    - Advancement in medical sciences leading to early diagnosis of claim
    - Advent of new illnesses etc.
    - Increase in the administration and distribution cost
- Alternatively there might have been an improvement in the morbidity and a case for reduction in premium.
- To use the exercise to create awareness about the latest health status in govt. and public

- It might be a policy requirement to update the premium after specific number of years.
- There might be a desire to modify the benefit structure and add more benefits to the existing scheme
- There might be a desire to increase benefit amount as the current benefits may be insufficient to meet the cost of medical treatment.
- A funding from an external agency (e.g. WHO) might be conditioned on the use of latest data.
- The opportunity to use census exercise to create a latest data pool.

(3)

ii)

Some of the relevant additions that can be made to the standard census format shall be as follows;

Addition: Medical status

- If suffering from any illness
- Any major illness in the past and its duration
- Any current medication
- Family History of any illness
- Hospitalization in the past and its duration.

Reason for the addition: Most of the above data points should be easy to collect and would throw light on the medical experience in terms of the past incidence as well as future likelihood. These data points may be used

- to revisit the design of the benefit scheme and modify it in line with the health care requirement
- to arrive at the quality adjusted parameters related to Mortality and morbidity
- to identify key priority area in the delivery
- to identify key priority area in terms of research focus

Addition: Health related parameters such as:

- Nutrition intake
- Weekly physical activity
- Level of immunization, especially in children
- Important indicators such as Blood Pressure, sugar level etc.
- Level of sanitary facilities
- Health awareness score

Reason for the addition: While availability of some of these parameters may not be easy and would depend on the level of health awareness in Actuaria, yet addition of these fields and the results can help the government and the administration trust of the scheme

- understand the current level of nutrition and Health
- to ascertain future trends in Healthcare needs
- to develop other health related benefits which are aimed at holistic health
- can become valuable inputs to health care research

(4)

iii)

Some of the possible benefit additions could be as follows:

- A lump-sum benefit for most of the diseases that require hospitalization; this benefit would help the policyholder
    - To make up of loss in income due to illness
    - In the cost of assistive devices
    - Recuperative care
    - To move to lesser stressful work condition during the recovery
- A lump-sum in the event of death due to illness after hospitalization,
    - such a benefit could be made mean tested
    - could be a nominal amount which could help the family in funeral expenses
- Access to alternative treatment such as Ayurveda, Unani, Sindha, Yoga and Homeopathic systems of medicines
- Access to diagnostic services at the government empanelled hospitals such as X-Ray, ECG, Ultrasound and other diagnostics services.
- Preventive healthcare tests once in a year in government empanelled diagnostic centre.
- Extra benefits to the rural and socially backward sector such as free medicines during the course of treatment, extra cash, dispensary services including domiciliary care.
- Specialist consultation facilities both at dispensary, polyclinic and hospital during the hospitalization and during the recovery
- An option to get cashless benefit in any of the empanelled hospitals instead of cash benefits. This can be enabled using a verification smart card at the point of delivery.
- Free/subsidized immunization for the children for the members of the scheme
- Local health awareness programme run using local stakeholders such as NGOs Micro Finance Institution etc.

Some of the method in which these additions could be funded would be as follows:

- By an increase in the level of premium, this however may not be a very acceptable measure especially if the scheme is aimed at the low income group
- By an increase in the level of subsidy provided by the government; this in turn would depend on the political promise made by the government and would increase the burden of government
- Government can finance the subsidy by the imposition of an additional tax (cess) aimed at Healthcare.
- Some of the cost could be reduced by partnering with local bodies such as NGOs, Panchayats, Micro Finance Institutions (MFIs).
- Many NGOs receive overseas funding from institutions like WHO for running Healthcare benefits in rural and socially backward region. By collaborating with the NGOs, some of these funds may be utilized.
- The Public Private Partnership model can be used by inviting corporate houses to partner in delivery of certain benefits
    - Direct funding
    - Donation of Medical equipment
    - Constructions of Medical centres

- Private companies in the business of healthcare may be invited to partner in certain services, such as immunization, diagnostics etc. This would result in publicity for them at a very nominal cost.
- Advertising revenue can be generated by inviting private companies to get exclusive visibility in the system. For e.g. naming a healthcare centre after a private company etc.

(8)

iv)

Biometric data can help claims management in the following ways:

- One of the key concerns in public health delivery is leakage of the benefits, i.e. multiple fraudulent claims by a single person.
- In a big population some of such cases may be very difficult to prevent.
- Mapping of the biometric data at point of delivery will reduce such fraudulent claims
- Biometric data mapping would also enhance the recordkeeping system and data storage shall be easier.
- If integrated with a system this will serve as standard database on health care delivery.

(2)

[17 marks]

Solution 5:

i)

Base Plan - Income Protection; Rider - CI

- While Income Protection would replace the loss of regular income in the event of a disability, CI would help the policyholders meet the financial cost of medical treatment & change in lifestyle in the event of a chronic illness.
- This would provide Policyholder a peace of mind as both loss of income and treatment cost would be covered under the policy.
- These two plans complement each other well, as some of the chronic diseases covered under CI would cause disability and hence trigger IP claim.
- However, CI benefit along with IP would reduce the incentive to return to work and would increase the cost of covers and related administrative cost.
- To address this, the income from CI could be included in the income for the calculation of replacement ratio, which would reduce the cost of cover for IP

Base Plan - Long Term Care; Rider - PMI

- At old age there might be a need for hospitalization due to acute conditions and PMI as a rider would meet the cost of the same. LTCI would cover the cost of care needed as a result of disability from chronic diseases
- Timely hospitalization when the need arises would slow down the progression of care need, reducing the overall claim cost

- The Hospitals and Care network for LTCI can be used to provide the PMI related benefits as well resulting in benefits of scale.
- Therefore such a benefit addition would add to the product attractiveness and economies of scale leading to higher profitability.
- Alternatively low cost design variants of PMI such as Optical and Dental care cover can be used as Optical and Dental care need would be high at old age.

Base Plan - IP; Rider - Accident and Sickness Insurance

- Accident and sickness insurance is usually a short term contract and works well when supplemented with an IP policy. For example, IP policies which have a long deferred period, accident and sickness insurance can replace the loss of income during the deferred period. Therefore, this combination provides an exhaustive coverage to the customer during working age.
- Additionally, a fixed lump may be paid if person loses a limb due to accident, which would be an additional enhancements to the benefits paid under IP.
- Accident and sickness insurance plans are usually cheaper in terms of cost and therefore, attaching them as a rider with IP will not increase the premium rates significantly and hence may be perceived by the customer as value for money product**.**

Base Plan – LTCI; Rider - IP

- Income Protection Plan meets the financial cost of the loss of income due to disability while in employment whereas the LTCI meets the cost of personal and nursing care post retirement.
- Therefore, a combination of these two products would ensure that cover continues beyond retirement age and hence would be an ideal solution to the long term Health Care needs of an individual.
- In the event of disability, if IP claim triggers, income from IP would help customer source the future premiums to ensure that all the benefits (IP and LTCI) remain in-force.
- However, both products are expensive and offering them under a single policy may make the premiums unaffordable for customers
- Therefore, this plan may not appeal to the customers as it may still look like two separate products rather than an integrated plan.

(6)

ii)

Benefits from Company's Standpoint

- The underwriting and policy acceptance process already in place for the base plan can be used for the rider as well, resulting in some cost savings for the company.
- If these cost savings are built into the pricing, this would make buying combination products more attractive and cheaper for customer than buying two standalone products separately, giving company a competitive edge over others.
- These products may become the preference of distribution channels and hence, increase the sales of the company.

- If the plan appeals to the customers and meets their needs, it gives company an opportunity to increase their income as customers effectively purchase several benefits from them instead of going to various other insurers. This also helps the company increase their market share.
- Removal of the overlap of benefit conditions of base and rider may help the company reduce the price of the product and hence increase sales
- Due to increases in sales, per policy expenses would further reduce, improving the profit margins of these plans

Benefits from Customer's Standpoint

- These plans might be available at a cheaper cost than buying two standalone products in the market, making them a better value for money products for customers
- Single policy offering multiple benefits from single insurer; this saves customer from the hassle of filling out multiple proposal forms and undergoing multiple underwriting procedures
- Managing one policy instead from one insurer is more convenient for the customer compared to multiple policies from different insurers
- Customers might not be aware of all the possible products/insurers available in the market and may not be able to effectively create an exhaustive health care portfolio for themselves. Combined plans are more customised to customer's needs and would give them convenience and flexibility

(4)

iii) The pricing challenges related to above designs would be as follows

Base Plan - Income Protection; Rider - CI

- There would be challenges related to data; to be able to price accurately, data would be required to model multiple decrements accurately. Such a data may not be easily available.
- Multiple state modelling is required to capture transition between various stages, which would make the model and hence pricing process very complex.
- There is no consistency between amount and timing of benefit payouts under CI and IP, which would make it difficult to price these risks for an Actuary
- There would be challenges in deciding the benefit structure of the plan for e.g., treatment of rider benefit, premium payments in case base claim triggers
- The benefits under IP and CI are different and therefore, there might be issues in using IP underwriting results for CI.

Base Plan - LTCI; Rider - PMI

- Under both LTCI and PMI plans, there could be multiple claims. Multiple state modelling is required to capture transition between various stages, which would make model and hence pricing process very complex.
- Both acute and chronic diseases are covered under this plan. Since such plans currently do not exist in the market and hence, sufficient data may not be available to estimate morbidity assumption adequately reflecting the future experience.
- Significant help from reinsurer may be required

- The nature of investments under LTCI and PMI plans varies significantly. While LTCI plans usually require investments in long term assets, PMI focuses on investments in short term liquid assets.
- This would make derivation of interest rate assumption for the combined fund difficult at pricing stage
- PMI plans are usually annual reviewable contracts. If PMI, attached as a rider to the base plan, is not annually reviewable, it would require significant loading for adverse deviation at pricing stage

Base Plan - IP; Rider - Accident and Sickness Insurance

- This plan would only make sense with IP policies which have a relatively longer deferred period. Hence, customers may not find this combination very attractive,
- which would make it difficult to ascertain the future new business volumes at pricing stage
- Since benefits under the base and rider plan are very similar, any significant difference in the amount of payouts under the two may be difficult to justify to customers. This has to be taken care of at the time of pricing
- Since the combination plan practically has no deferred period, it puts the company at a risk of anti selection.
- This has to be adequately addressed in the morbidity assumptions used at the time of pricing.
- Accident and Sickness insurance contracts are usually annual reviewable. If attached as a rider to the base plan, it is not annually reviewable, it would require significant loading for adverse deviation at pricing stage

Base Plan – LTCI; Rider - IP

- This combination may not appeal to the customers as it would resemble like two independent products than an integrated one. It would be very difficult to ascertain the future new business volumes at the stage of pricing under this combination
- Both IP and LTCI products are complex products in terms of benefit structure and claim definitions. Distribution channels may demand a higher level of commissions for these products, making them more expensive and uncompetitive
- After the age of retirement, claim criteria under this plan may switch from work related activities to activities of daily living. This would make Multi state models capturing these transitions even more complex
- The policy term under this combination would be very long as it provides coverage for both pre and post retirement age. Suitable assets of such long duration may not be available in the market to meet the liabilities
- and hence it would create asset liability mismatch for the company in future.
- There may be regulatory restrictions on the product design due to such long term nature of this plan
- Claim amounts under IP benefit are linked to wage inflation whereas LTCI claims are linked to medical inflation. There would be separate assumption requirement in modelling each claim payouts
- There may be challenges associated with getting a comprehensive reinsurance arrangement for such plans **(6)**

[16 marks]

Solution 6:

i)

The assumptions would be required to be calculated separately for PMI and LTCI. Since the valuation exercise is being carried out for the combined entity it would be important to take into account the factors that have emerged, or are likely to emerge in future.

The additional factors would be as follows:

Discontinuance

1. Policyholder's area of concern: Policyholder's may be concerned with the treatment of the policies in the event of a merger hence the Lapsation may increase, at least in near future.
2. Similarly the distributors may also be concerned with the merger and may leave (or get lured away) at least in the short run impacting the overall persistency.
3. Data availability: Adequate data may not be available for products from either company an allowance would be required to be made for the same.
4. If the assumptions are on a combined basis i.e. on merged data, the company would need to ensure that too much cross subsidization between products does not occur.
5. Product Portfolio: Since the merged entity will have products from both the companies its overall product offering may improve resulting in lower Lapsation or higher renewal rates.
6. Benefits of synergies; There is likely to be a transfer of best practices and benefits emerging from the economies of scale which is likely to impact overall persistency.
    - Stronger distribution & channel partners
    - Greater follow up in area of renewals and reinstatement
    - Better counselling services in LTCI
    - Better care homes in case of LTCI
    - Better services in case of PMI such as Ambulance, Blood Banks etc would result in better persistency
    - Company may offer more attractive renewal rates for PMI.
    - Greater advertising and marketing spend.
7. Brand Value: The brand value of the combined entity is likely to be stronger and hence people might want to stay with the company

Morbidity/Mortality

1. Selective Lapsation: The increase in Lapsation immediately after the merger may be selective as high risk individuals are less likely to get cover otherwise.
2. Benefit of diversification: Since the merged entity is likely to have a greater in-force book & hence greater pooling of Risk, allowance should be made for this.
3. Benefits of synergies; There is likely to be a transfer of best practices and benefits of scale which is likely to impact the mortality and morbidity assumptions
    - Reduction in Anti Selection due to greater Risk pooling.
    - Better medical underwriting and policy acceptance processes.
    - Claims Management & controls system and fraud management.

4. For a product like LTCI, improvement in average mortality and morbidity is likely to increase the average payout as the duration for which the customer payouts are made is going to increase.
5. However for PMI better facilities may result in a reduction in the Hospitalization and early recovery.
6. This is likely to impact the future improvements in mortality and morbidity for the policy portfolio.

Expenses

1. Benefits of the economies of scale is likely to be visible the most in the case of expenses. This is going to be in the areas of
   - Optimum utilization of man power & resources, hence lower salaries and wages cost.
   - Optimum use of Office space, company may close some branches in the same city.
   - Greater leverage with the third parties due to increase of scale, hence may negotiate better rates with Reinsurers, third party providers, Hospitals etc.
   - Lower training cost etc.
2. This would reduce per policy loading for the renewal expenses.
3. Some of these rate may be passed on to the customer in the form of lower renewal rates for PMI and downwards review of premium in the case of LTCI.
4. These factors are required to be taken into account while setting the expense assumptions.

Interest rate

1. The merger is going to increase the asset base of the company and may result in the increase in yields on existing assets as well as yield to be obtained in future years; this increase would be due to
   - Increase in the overall asset exposure resulting in increase in the combined yield
   - Increase in the overall diversification
   - Exposure to assets which either company could not have individually
2. For the interest rate assumption there would also be a reduction in the risk allowances, this would largely be driven by the increase in overall asset base of the company and would result in.
   - Reduction in the concentration risk
   - Reduction in the mismatch risk
   - Reduction in the interest rate risk
   - Reduction in the equity risk due to diversification
3. There might be a favourable tax treatment for certain asset category which needs to be taken into account.

Others

Benefits for system integration: Combined entity may have better data management and extraction systems resulting in lesser possibility of errors and hence lesser requirement for prudency. Therefore, would result in lesser MAD requirements in the assumptions.

Since the data volume increases data credibility, results of any predictive analysis shall be more reliable. **(8)**

ii) Some of the possible variations in the investment pattern between the LTCI and PMI would be:

PMI

- Since PMI is a short term contract the reserving requirement shall be very low & liabilities will be short term. Therefore the basic investment objective shall be to ensure that there is adequate liquidity to meet the outgoes as they fall due.

- Therefore the investment shall in highly liquid assets to meet the liabilities, the ideal investment assets will be money market instruments such as treasury bills, fixed deposits etc.

- Since liquidity and security is a greater priority and investment return are not very important, govt securities and deposits with nationalised banks or highly rated private banks may be ideal destination.

LTCI

- In contrast to PMI, the Reserving requirement under LTCI would be reasonable and would be long term and therefore, in addition to liquidity and security, asset liability matching and investment return would also be a desirable objective.

- Therefore the investment should be a combination of long, medium and short term assets to ensure that there is liquidity for current expenses and the long term liabilities are matched.

- Since security is a desirable feature, ideal asset would be Government backed securities and high rated corporate bond. The securities could be fixed interest or index based depending on the long term inflation expectations **(3)**

[11 marks]

Solution 7:

The discounted mean term represents the mean term of the payments, where each term is weighted by the present value of that payment.

The widening of the gap between asset and liability DMT (Discounted Mean Term) would basically be because of the mismatch between the cash-flows underlying asset and liabilities, some of the reasons for this could be:

Change in liability Cash-flows

1. Change in the product mix; the product mix of the company's business might have changed for e.g. impacting the underlying liability cash-flows for e.g.
    - Increase in the share of PMI in the overall business reducing the average term (& the DMT)
    - Increase in the share of IP and LTCI increasing the average term of the products

2. Change in customer segment for e.g. younger people might be buying the plans opting for longer durations
3. Change in the expected longevity, assuming that the assumptions being used are reflective of the current trend; this would mean that the average duration of the liabilities would change.
4. Change in longevity would also impact the claims in payment, especially for IP and LTCI business.
5. Change in the commission structure, for e.g. higher commission upfront and lower commission later would impact the liability cash-flows.
6. Change in expense structure; for e.g. company might have become more expense efficient/inefficient, reducing/increasing the expected expense outgo and hence the liability cash-flows in future.

Change in Asset Cash-flows

1. The asset cash-flows may not have changed (or changed proportionately) in response to any of the above change in liability for following reasons
2. Asset market may not be very deep and hence there may not be enough liquidity at all durations which means that assets may not necessarily available for all the liability durations.
3. The yield at some duration may be very attractive therefore the company might be deliberately mismatching to lock higher yield.
4. Some of the assets may not be easily valuable and sufficiently liquid and the expected cash-flow from such assets may be on old assumption for e.g. for property, the rental yield being used may not be upto date

Other factors

1. Regulatory requirement around ALM might have changed for e.g.
   - to use prudent (reserving) cash-flows instead of best estimate
   - Some of the assets e.g. derivatives may have been made inadmissible for ALM purpose.
2. Similarly professional standards/guidelines relating to ALM may have been changed
3. Discount rate used for the estimation of DMT might have changed.
4. An allowance for emerging risks may have been made in the asset or liability cash-flows impacting the DMT separately.

[6 marks]