

“Pricing of Term Assurance policy – A critical actuarial evaluation of the product of LIC”

by
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Abstract

Life insurance is a scheme of economic co-operation by which members of the community share the unavoidable risk. Life insurance is a long term contract providing financial security to the assured and his/her family. Other benefits provided by life insurance products apart from risk cover are returns and tax-benefits. There are many traditional life insurance products like the endowment, term assurance and non-traditional product unit linked insurance plan offering different levels of the above benefits. The life insurance product design is based on the theory of actuarial studies, which is an approach based on the theory of present, future values and probability theory.

Term assurance is a product covering the risk (in this case risk means death) of the policy holder. In the event of the death of the policy holder during the policy term the nominee will receive the sum assured. The policy holder will not get any benefits if he or she survives the policy term.

The paper attempts a critical actuarial valuation of term assurance policy of the LIC of India. Expected present value of the benefit cost ratio from the policy holder’s point of view is computed at different possible inflation adjusted discount rates. The valuation uses the mortality rates published by IRDA, and it is based on certain realistic assumptions regarding withdrawals. The paper ends with some suggestions to the LIC for a better product design.

Key words: Term assurance, Actuarial valuation, Benefit cost ratio, Product pricing

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1. Introduction

Life is full of risks. Man, being a social animal and risk averse tries to reduce risk. An age old method of sharing of risk through economic co-operation led to the development of the concept of insurance. Insurance is described as a social device to reduce or eliminate risk of loss to life and property. Insurance is a collective bearing of risk. Insurance spread their risks and losses of few people among a large number of people as people prefer small fixed liability instead of big uncertain and changing liability. Insurance is a scheme of economic co-operation by which members of the community share the unavoidable risks. Insurance cannot prevent the occurrence of risk but it provides for the losses of risk. It is a scheme which covers large risks by paying small amount of capital. Insurance is also a means of savings and investment.

Insurance can be defined as a legal contract between two parties whereby one party called the insurer undertakes to pay a fixed amount of money on the happening of a particular event which may be certain or uncertain. The other party called the insured pays in exchange a fixed sum known as premium. The document which embodies the contract is called the policy.

Types Of Insurance

Insurance sector has divided itself into companies that sell policies on the person, known as life insurance and general insurance or non-life insurance policies which covers the loss from a particular event on automobile, property or any other casualties.

Life Insurance

Life insurance is a contract between two parties, the assured and the assurer, whereby, the latter for consideration promises to pay a certain sum of money to the former on the happening of the event insured against. The life insurance contract provides for the payments of an amount on the date of maturity of the contract or at specified dates at periodic intervals or at untimely death. The contract also provides that the insured shall pay premium periodically to the insurer. Life insurance is generally a long-term contract which provides a sense of security to the assured and his family. Life insurance is concerned with basically two hazards in the life of a person: that of dying prematurely leaving behind a dependant family and that of living to old age without financial support.

Benefits of life insurance

Life Insurance safeguards the insured's family against an untimely death and provides for a secured income. It is a means of compulsory savings and a source of income during old age. It helps in meeting certain periodic financial needs, either for a child's education or marriage and improves the life style of the insured and his family. The important aspect is that, it provides tax benefits under section 80 C of the Income Tax Act to the policy holders.

Types Of Life Insurance Products

The life insurance products are broadly classified as traditional and non traditional products. The traditional products consist of endowment policy, term assurance policy whole life policy, money back policy, children policy and the other retirement policy. The non-traditional policy offered in the market is unit linked insurance policy or plan with variations in the plan.

Role Of Agents In Life Insurance Products Marketing

Life insurance is a complex product for an ordinary citizen to understand. Hence there is need for middle men like agents who will explain the structure of life insurance products to the policy holders. In addition to agents, we have personal financial advisors in the current market who can advise individuals depending on the specific individual needs.

Term Assurance

Term assurance is the cheapest form of insurance. This plan of insurance is just a **risk cover** plan. Young people who cannot afford high premiums can go in for this policy and obtain substantial cover at a very moderate cost. Term insurance is often the most inexpensive way to purchase a substantial death benefit on a coverage amount per premium rupee basis.

Actuarial Valuation

Actuarial science is based on the theory of compounding, discounting and probability. The actuarial valuation is a process of pricing of the insurance products taking into account likely future experiences in respect of mortality, interest, expenses and sum assured. The future experience may or may not conform to the expectations of the policy holders. If they conform, the premium charged could be considered adequate and the business is set to be properly funded.

Pricing is an important decision for any company since it affects demand. Both price and demand in turn affects revenues and profits. Hence it is an important decision in the case of an insurance company as well.

2. Objectives

An attempt is made in this paper to critically evaluate the pricing of term assurance product. The term assurance policy of Life Insurance Corporation is selected since it is the market leader with about 66% market share and hence all other insurance companies follow LIC's pricing model with very little variations.

3. Methodology

An analytical study was done to understand the actuarial methodology of product pricing for Term assurance. The actuarial valuation of the products was analyzed by using benefit cost ratio.

Term assurance Actuarial valuation is analyzed for a Sum assured of Rs.5,00,000/- at three different entry age of the policy holder being 25 years, 35 years and 45 years for a term of 15 years.

Assumptions for term assurance actuarial valuation: The actuarial valuation of mortality rate is based on the mortality table as per the Published Mortality Table (effective from 01/01/2005) with the concurrence of IRDA which is not gender biased.

Output methodology:

- 1) Analysis is based on cash flow method.
- 2) Calculation of benefit cost ratio based on expected present value of cash flows (expected present value of terminal benefits and expected present value of premium paid).
- 3) Expected present values of cash flows at three different rates of return being 3%, 5% and 7%. Based on industry experts opinion, the inflation adjusted discount rate(real rate) beyond this range (less than 3% and greater than 7%) may not be realistic in the Indian economic condition in the near future and hence we have considered the required rate of return at 3%,5%,7%

4. Results

Analysis of Actuarial valuation of Term assurance for sum assured Rs.5 lakhs, rate of return at 3%, for a term of 15 years

Entry Age	Premium paid	EPV of terminal benefits	EPV of premium paid	Benefit Cost ratio
25	Rs.6,000/-	Rs.33,056/-	Rs.46,882/-	0.71
35	Rs.9,605/-	Rs.68,616/-	Rs.74,790/-	0.92
45	Rs.22,025/-	Rs.1,75,164/-	Rs.1,68,733/-	1.02

Table 1: Table summarizing the actuarial valuation of term assurance for sum assured Rs.5 lakhs, rate of return at 3%, for a term of 15 years

- The premium at the entry age of 25 years is Rs.6,000/- per annum for a term of 15 years. The expected present value of total benefits is Rs.33,056/- and the expected present value of total premium is Rs.46,882/-. This yields a benefit cost ratio of 0.71.
- At the entry age of 35 years, premium is Rs.9,605/- and the expected present value of total benefit, expected present value of total premium and benefit cost ratio are Rs.68,616/-, Rs.74,790/- and 0.92 respectively.
- The benefit cost ratio is 1.02 which is greater than one when the entry age is 45 years and premium is Rs.22,025/-, the expected present value of benefits and expected present value of total premium being Rs.1,75,164/- and Rs.1,68,733/- respectively.

Analysis of Actuarial valuation of Term assurance for sum assured Rs.5 lakhs, rate of return at 5%, for a term of 15 years

Entry Age	Premium paid	EPV of terminal benefits	EPV of premium paid	Benefit Cost ratio
25	Rs.6,000/-	Rs.27,495/-	Rs. 42,415/-	0.65
35	Rs.9,605/-	Rs.56,320/-	Rs.67,651/-	0.83
45	Rs.22,025/-	Rs.1,43,759/-	Rs.1,52,895/-	0.94

Table 2: Table summarizing the actuarial valuation of term assurance for sum assured Rs.5 lakhs, rate of return at 5%, for a term of 15 years

- The premium at the entry age of 25 years is Rs.6,000/- per annum for a term of 15 years. The expected present value of total benefits is Rs.27,495/- and the expected present value of total premium is Rs. 42,415/-. This yields a benefit cost ratio of 0.65.
- At the entry age of 35 years, premium is Rs.9,605/- and the expected present value of total benefit, expected present value of total premium and benefit cost ratio are Rs.56,320/-, Rs.67,651/- and 0.83 respectively.
- The benefit cost ratio is 0.94, when the entry age is 45 years and premium is Rs.22,025/- the expected present value of benefits and expected present value of total premium being Rs.1,43,759/- and Rs.1,52,895/- respectively.

Comparing the three different entry ages it is noticed that there is substantial increase in the benefit cost ratio from the entry age of 25 years to 35 years and from 35 years to 45 years though the rate of return is constant and premium is higher at higher entry age.

Analysis of Actuarial valuation of Term assurance for sum assured Rs.5 lakhs, rate of return at 7%, for a term of 15 years

Entry Age	Premium paid	EPV of terminal benefits	EPV of premium paid	Benefit Cost ratio
25	Rs.6,000/-	Rs.23,080/-	Rs.38,680/-	0.60
35	Rs.9,605/-	Rs.46,634/-	Rs.61,714/-	0.76
45	Rs.22,025/-	Rs.1,18,995/-	Rs.1,39,634/-	0.85

Table 3: Table summarizing the actuarial valuation of term assurance for sum assured Rs.5 lakhs, rate of return at 7%, for a term of 15 years

- The premium at the entry age of 25 years is Rs.6,000 per annum for a term of 15 years. The expected present value of total benefits is Rs.23,080/- and the expected present value of total premium is Rs.38,680/-. This yields a benefit cost ratio of 0.60.
- At the entry age of 35 years, premium is Rs.9,605/- and the expected present value of total benefit, expected present value of total premium and benefit cost ratio are Rs.46,634/-, Rs.61,714/- and 0.76 respectively.
- The benefit cost ratio is 0.85, when the entry age is 45 years and premium is Rs.22,025/- the expected present value of benefits and expected present value of total premium being Rs.1,18,995/- and Rs.1,39,634/- respectively.

Comparing the three different entry ages it is noticed that there is substantial increase in the benefit cost ratio from the entry age of 25 years to 35 years and from 35 years to 45 years though the rate of return is constant and premium is higher at higher entry age.

Comments on the Benefit Cost Ratio

Comparing the three different entry ages it is noticed that there is substantial increase in the benefit cost ratio from the entry age of 25 years to 35 years and from 35 years to 45 years though the rate of return is constant and premium is higher at higher entry age. It is hence observed that the product is not rightly priced by the actuaries as the benefit cost ratio increases proportionally with age. If a product is mispriced the consumers are deprived of the value for money, this leads to consumers dissatisfaction which is not a good indicator for any business and industry.

Abstract of Benefit Cost Ratio

E ntry Age	ROR @ 3%	ROR @ 5%	ROR @ 7%
25	0.71	0.65	0.60
35	0.92	0.83	0.76
45	1.03	0.93	0.85

Table 4: Table showing the summarized benefit cost ratio

- The summarized representation of benefit cost ratio for three required rate of return at three different entry ages helps us to understand that the benefit cost ratio is lower when the policy holder buys the product at a younger age (i.e., 25 years) irrespective of the sum assured. The policy holder gets higher benefit cost ratio as the entry age increases (i.e., 35 years and 45 years) irrespective of the sum assured. The benefit cost ratio is reducing as the required rate of returns are increasing which indicates that if the required rate of return increases the benefits from the insurance product reduces, but still the product is sought because of the risk cover facility it offers.
- The benefit cost ratio is reducing as the required rate of return are increasing (3%→5%→7%). The benefit cost ratio for various sum assured is directly related to the entry age at a particular rate of return. The term assurance plan is sought only for the purpose of risk cover facility it offers.

Inferences for Term assurance

- 1) The study helps us to infer that the term assurance product is not rightly priced by the actuaries. The study could not ascertain the reason for such mispricing of the product. There appears to be no awareness to the professionals of the product being mispriced.
- 2) Discussion with actuaries reveals that it is a tradition in insurance to fix the premium in such a way that as age of entry increases the benefit cost ratio reduces, such a pricing will encourage policy holders to start thinking of planning for future security from an early age. The researchers have also noticed the same that is, the benefit cost ratio decreases as the age of entry increases while working with the life insurance products.
- 3) Discussion with life insurance agents who are working with promotion and distribution also signifies that the benefits decrease as the age of entry increases in case of life insurance products. Hence it encourages early entry of people for any insurance product.

In this back drop the Table number 4 shows that term assurance product of LIC is not confining to the tradition discussed above. Hence one can see that the product is not properly priced .The premium fixation does not conform to the set pricing tradition of the life insurance product.

5. Implications

➤ The policy holder's in all age group who are looking for insurance cover with lesser investment returns generally opt for term assurance. Term assurance product is dear to the policy holder's as they get a higher risk cover for lesser premium.

➤ It is found that Age differences do not impact policy holders' expectation about term assurance satisfying their risk cover needs. The policy holder's in all age group who are looking for insurance cover with lesser investment returns generally opt for term assurance.

6. Findings

- 1) Term assurance is the traditional product which focuses on the risk cover of the policy holder and hence the premium charged for any sum assured are relatively lesser compared to other insurance products.
- 2) The policy holder will not receive any benefits on his/her survival during the term of the insurance, rather the sum assured is received by the policy holder's nominee on his/her demise during the tenure of the policy.
- 3) The policy holder's avail risk cover by paying lesser premiums which give scope for additional investments to earn returns by opting for other investment options with the balance of the investment amount, which they would have paid as premium if they would have chosen other insurance products.
- 4) This product is not promoted in large scale as the endowment policy by the agents, as the commission that they earn by selling this product is lesser.
- 5) The investors are making wiser decisions as they are educating themselves through the help of technology and media and are opting for term assurance for the returns provided to their dependants under uncertain circumstances along with the higher risk cover.

7. Conclusions

It is clear that the term assurance product of LIC is mispriced and such a mispricing adversely affect the revenues and profitability of LIC .The policy holders also will not get the value for money. Hence it is advisable for LIC to look into the premium fixation of this product in the interest of the company, policy holders and society at large.

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