

# **Valuing the Term Insurance Products in the Indian Market**

**R. Rajagopalan**

**Dean (Academic Affairs)  
&  
Syndicate Bank Chair Professor**

**T.A Pai Management Institute (TAPMI)  
Manipal- 576 119  
India  
[raja@mail.tapmi.org](mailto:raja@mail.tapmi.org)**

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## Abstract

Pure level term insurance is the simplest life insurance product. A policyholder pays a series of equal periodic premiums. If he dies during the term of the policy, his nominee gets the sum assured from the insurer. Instead, if he survives the term of the policy, the insurance company does not pay anything to him.

Still, this simple product was not offered in the Indian market till recently. Life Insurance Corporation (LIC) of India was a government monopoly. LIC offered only the so-called 'bundled products', namely, Whole Life, Endowment, Money-Back etc. Such bundled products combine the insurance and savings products into one. A consumer thus could choose only one of the available benefit bundles: some life insurance, some tax benefits and some (uncertain) investment returns.

Fortunately, things are changing. Since the liberalization of the insurance industry, several private insurers have entered the market with pure term insurance products. This has forced LIC also to offer its own term insurance product. Aggressive pricing by competing insurers has led to a dramatic reduction in premiums. Insurers are also targeting specific buyer segments like high net-worth individuals, younger salary earners, workingwomen etc. New distribution channels like corporate agencies, including banks, have been permitted. Given their simplicity, term products may be the first to be pushed through such new channels, at significantly lower distribution costs than the traditional agency channel.

This paper uses available data on mortality rates and term structure of interest rates in India, to address the following:

1. Are the pure level term policies on offer in the Indian market worth it?
2. Specific implications for insurance buyers, insurance companies, the Insurance Regulatory and Development Authority (IRDA) and for further research.

## Findings

### For an insurance buyer

1. It pays to shop around and not to rely on what the agents/ insurance companies claim. If you don't, you may be paying double the going price!
2. The premiums for term policy are expected to come down substantially in the coming years. It is perhaps wise to take a term policy for a short term like 5 yrs now, and take advantage of the falling premiums due to the intense competition.
3. Even if one were to buy the cheapest available policy, the loadings or risk premium seems to be very high. It gradually declines from a very high 107% on a 5-year policy to a low of 49% on a 30-year policy. There are reasons to believe these are conservative estimates and hence actual loadings are likely to be even higher.

### Insurance Companies

1. Subject to regulations, they could target specific segments likely to experience significantly lower mortality rates. The basis of segmentation could be geographical/ income levels/ literacy levels and so on. Such targeting may also help achieve economies in marketing expenses.
2. Given the commodity nature of a level term policy, they could focus on the newly allowed corporate agency channel to push term policies. This would permit them to be more aggressive in their pricing, without sacrificing margins.

### IRDA

1. IRDA should insist on industry standard combinations of age, term and sum assured in illustrations used in product brochures/ websites etc to make it easy for a buyer to compare prices.
2. IRDA should assume responsibility for publishing mortality tables and thus provide reliable data to the public to help them judge the extent of loadings by the insurers.
3. IRDA should seriously consider sponsoring the development of a spreadsheet package, as a ready reckoner to choose the cheapest/best option available in the market for standard risks for each combination of age, sum assured, term etc. This can be hosted in its website as a public good available to all buyers.

### Further Research

1. The first priority is to develop mortality tables for specific target segments of population. The real bottleneck will be data availability. This would be of tremendous utility to both buyers and insurers.
2. Development of a spreadsheet package, which can be marketed as a ready- reckoner for choosing the cheapest level term policy. This must use the detailed premium tables of each insurer for standard risks. This could also be of use to insurance brokers, who are supposed to advice a buyer of the best choice available in the market to meet his insurance needs.

## 1. Introduction

Pure level term insurance is the simplest life insurance product. A policyholder pays a series of equal periodic premiums. If he dies during the term of the policy, his nominee gets the sum assured from the insurer. Instead, if he survives the term of the policy, the insurance company does not pay anything to him. Therefore, a policyholder 'receives' benefits only if he dies!

Though it is the simplest product, it was not offered in the Indian market till recently. The Life Insurance Corporation (LIC) of India was a government monopoly. The entire premium paid on life insurance policies was, and is, eligible for tax rebate within the limits prescribed from time to time under Sec 88 of Income Tax Act. LIC offered only the so-called 'bundled products', namely, Whole Life, Endowment, Money-Back etc.

Such bundled products combine the insurance and savings products into one. Only a part of the premium goes towards life insurance. Another part covers the operational costs and profit contribution to the insurance company. The balance, along with investment returns, accrues as a saving (cash value) in the policyholder's account. Such savings are returned to the policyholder on survival till the end of the specified term (endowment) or as per a periodic schedule (money-back). Typically, such policies are 'participating' policies: apart from the sum assured and other guaranteed benefits, the policyholder is also entitled to additional benefits like bonus accrued etc., based on actual investment returns.

A consumer thus could choose only one of the available benefit bundles: some life insurance, some tax benefits and some (uncertain) investment returns. For example, a low-income individual, who preferred the maximum possible life insurance cover with a limited premium amount, could not do so. He had to live with less than his desired life insurance cover. Similarly, a high-income individual, who had already hit the Sec 88 limits, would be forced to save through such a life insurance policy, even if he wanted only simple life insurance. He could have been better off buying a term insurance policy for the same sum assured at a lower premium and investing the excess elsewhere.

It was also very difficult for a consumer to judge whether he was getting good 'value' for his premium money. Value, in this context, means the following:

- Is the insurer charging him an actuarially fair insurance premium to cover his mortality risk?
- Is the insurer operating efficiently, minimizing operational costs and achieving better investment returns at acceptable risk?
- Is the insurer allocating the surpluses in a fair manner between policyholders and insurer's profits?
- Is the insurer solvent and liquid enough to ensure all promised payments due to the policyholders?
- Is the insurance policy offering him any incremental tax benefits on the savings component, compared to other tax preferred investment opportunities like Public Provident Fund (PPF)/ National Savings Certificate (NSC) etc?

Fortunately, things are changing. Since the liberalization of the insurance industry, several private insurers have entered the market with pure term insurance products. This has forced LIC also to offer its own term insurance product. Aggressive pricing by competing insurers has led to a dramatic reduction in premia. The dust is yet to settle on this price competition. Insurers are also targeting specific buyer segments like high net-worth individuals, younger salary earners, working-women etc. New distribution channels like corporate agencies, including banks, have been permitted. Given their simplicity, term products may be the first to be pushed through such new channels, at significantly lower distribution costs than the traditional agency channel.

Given the above, how can potential insurance buyers compare alternative policies and choose? Is it better for them to buy only near term policies- and wait to get the benefit of lower prices at the end of this phase of intense competition? Are the new entrants driving the prices to such low levels as to threaten the industry's profitability and insurers' solvency?

In Section 2 we develop a framework for valuing a pure term assurance product. We also discuss the data required on mortality rates and term structure of interest rates. We identify the cheapest policy available in the market for a 30-year-old healthy male for various terms. We also develop and estimate two measures of loading, one to measure the loading from the buyer's point of view and the other to measure the gross margin to the cheapest insurer. In section 3, we discuss the implications of our findings.

## **2. Framework for Pricing and Valuation**

In pricing any product, we can proceed from two ends:

- Value to the customer as reflected in his willingness to pay
- Cost of providing a product or service, including reasonable returns to risk capital

Insurance industry adds economic value only if the value to the customer is more than the cost of providing that insurance. Individuals are typically risk-averse. They are willing to pay to avoid risks, in this case, financial risk of premature death. By pooling such risks across numerous individuals, an insurance company makes that financial risk more predictable for itself. This is the secret of value addition. In the process, an insurance company has to incur costs of product design, marketing, distribution, underwriting<sup>1</sup>, collection of premium, investment management and settlement of claims. It also has to put up some equity capital to cushion residual risk<sup>2</sup>. If these costs are expected to be less than the value added to the consumers, there is a profitable business opportunity.

### **2.1 Willingness to Pay**

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<sup>1</sup> Underwriting is the process used by an insurer to decide whether to accept a particular risk (proposal for insurance) and if so, at what price (premium).

<sup>2</sup> For example, the chance that the group of insured may die, on the average, earlier than anticipated or that the investment returns may be less than expected.

### 2.1.1 Expected Mortality Charges (Consumer Benefit)

In term insurance, the only benefit received by an insured, if at all, is the sum assured in case of death before the term is over. Of course, the 'utility' or 'perceived value' of this benefit to him depends upon his risk aversion, his emotional attachment to his dependents, their financial status otherwise etc. It is not necessary for us to get into such non-monetary aspects here<sup>3</sup>.

The money value of this benefit to him, at the time the policy is initiated, depends upon

- How likely is he to die before the term?
- If he dies during the term, when?
- What is the opportunity cost of money (discount rate) to him?

### 2.1.2 Importance of Mortality Tables

The first two aspects are obviously dependent on the characteristics of the individual: age, health status, living habits, occupation and so on. It is usually assumed that the individual would know more about these matters than the insurance company<sup>4</sup>. Nor is he likely to bare it all for the insurer. Therefore, there is a problem of 'information asymmetry' between the buyer and the seller of an insurance product. Compared to the general population, insurance buyers as a group may have a tendency to die earlier on the average, in spite of the best efforts of the insurer to identify such higher risks. This is called the problem of 'adverse selection'. Having insured himself against death, an insured person may also assume a more risky life style, for example, smoking more cigarettes. Though not much likely in life insurance, this is called 'moral hazard'. The insurer has to provide a cushion for this too<sup>5</sup>.

Therefore we need the most appropriate estimates for probability of death at various ages during the term of the policy. Such tables are called 'mortality tables'. Unfortunately, prospective insurance buyers do not have ready access to such tables. We may use the mortality tables published by the Census authorities for the general population. Possibility of adverse selection, as discussed above, may suggest that use of this mortality table will underestimate chances of death during term and hence the value of such benefits to the policyholder. On the other hand, one may also argue that the people, who could afford insurance products and accepted by insurance companies, are likely to be comparatively richer/ healthier. Hence they might live longer than the average person of the same age.

Alternatively, we can use such mortality tables made public by insurance regulatory authorities, if any. Such tables do not exist in India, as the LIC was a monopoly till recently. The only published mortality table is by LIC [1]. However, we must remember that any

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<sup>3</sup> As our main focus here is on comparing competing products offering the same protection against risk

<sup>4</sup> I wonder whether an individual is wiser than an insurance company on the chances of his death at various ages. I suspect we get swayed by a) the advertisements of the insurers and b) by the deaths of our near and dear ones, into thinking that the chances are higher than what they 'really' are.

<sup>5</sup> That is why insurance coverage typically excludes death due to suicide

insurance company is an 'interested party'. Any such table provided by them, therefore, may exaggerate chances of death to justify higher premium charges.

### 2.1.3 Period Vs Cohort Mortality tables

The mortality rates we use should ideally be prospective mortality rates. If we rely on past data, we may overestimate chances of death. This is because, in general, there is an increasing trend in life expectancy due to better nutrition, improvement in access and quality of health services etc. A *period mortality table* gives us the mortality rates at various ages prevailing during the time during which data was collected. For example, what was the mortality rate during year 2000, among those who were 40 yrs of age in the beginning of year 2000? If we use this mortality rate to estimate mortality rate in future, say in 2010, among those who would be 40 yrs of age in the beginning of 2000, we are likely to exaggerate their mortality rates.

In contrast, a *cohort mortality table* seeks to provide prospective mortality rates by making some assumptions about likely changes. To illustrate, consider those who are thirty years in the year 2002 (30 yr cohorts). Then, such a table would tell us what is likely to be the mortality rate among these cohorts 30 years from now, that is, in the year 2032 when these cohorts would be 60 years of age. Such tables do not exist in India.

### 2.1.4 Select Vs Ultimate Mortality Rates

Let us realistically assume that an insurance company would ascertain the health status of a prospective buyer, say a Mr. Abhi, 35 yrs of age, before accepting his policy. Also suppose that the same insurer had sold a policy five years back to a Mr. Paanch, who was 30 yrs then (hence 35 yrs now). Can we say that the chances of death in the coming years are the same for both?

If we think about it, it is likely to be less for Mr. Abhi, because the insurer has checked his health status just now. There is a distinct chance that Mr. Paanch's health might have deteriorated since the last five years. This hunch has been found to be true. The chances of death of fresh policyholders like Mr. Abhi are called 'select mortality rates' and those of 'old' policyholders like Mr. Paanch are called 'ultimate mortality rates'. Assuming they are still alive after say another five years, this difference in their mortality rates is likely to vanish. Thus 'select mortality rates' will coincide with 'ultimate mortality rates' after such a long period.

### 2.1.5 Mortality Tables for Specific Segments

Just like in any other characteristic, the current and prospective policyholders are not all homogeneous with respect to mortality rates. For example, it is well known that the mortality rate among adult women is less than that among men at the same age. Therefore, life insurance policies sold to women should cost less. In a competitive market, different insurers may focus on specific segments and hence face different mortality rates. For example, suppose an insurance company decides to limit itself to the niche market of thirty-something

CEOs. They may quote what looks like very attractive premium rates. But, in fact, they might be making more profits because such policyholders may show a much lower mortality rate<sup>6</sup>. It is well known that the life expectancy in some southern states like Kerala and Tamil Nadu are significantly more than the national average. Therefore, if legally permitted, some insurers may offer policies with lower premiums in such geographical and other segments.

#### 2.1.6 Discount Rate

In a level term plan, the policyholder is required to pay his premium not all at once at the beginning<sup>7</sup>, but in fixed amounts periodically (annually, half-yearly, quarterly, monthly etc). To estimate the expected present value of his premium payments, we must account for the following:

- He has to pay the premium only as long he is alive. Therefore we have to use mortality rates as discussed above.
- Future premiums have to be discounted by an appropriate discount rate and time period

Similarly, the death benefit (sum assured) received from the insurer in case of death during the term also needs to be discounted.

What discount rate should one use? Traditionally, a constant discount rate was used for all the years in the term. This was either the risk-free rate or the discount rate for AAA rated corporate debt, corresponding to the term of the policy. This practice is appropriate only if the term structure of interest rates<sup>8</sup> can be assumed to be flat. This is typically not the case. Therefore, the current recommended practice is to discount each cash flow by the current zero-coupon yield on a treasury security or corporate debt of the same maturity [2]. For example, a death benefit expected to be received five years from now, would be discounted by the current yield on a 5-yr zero coupon treasury or corporate security.

However, to do so, there must be reliable market quotes for long-term treasury and corporate securities covering a range of say 1-40 yrs. This is not currently the case in India. Only recently, some 20 yr treasury bonds have been issued<sup>9</sup>. Therefore, we have to necessarily extrapolate the estimated yield curve based shorter terms (say 10 yrs).

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<sup>6</sup> Not necessarily in the professional sense!

<sup>7</sup> Such policies, where the entire premium is paid in one shot at the beginning of the term, are called 'Single Premium' policies. We are not considering them here.

<sup>8</sup> Term structure is the relationship between the tenure of a cash flow and the annual rate of interest that the market seems to be using to discount it to the present value (price).

<sup>9</sup> In its latest credit policy, RBI has said that it is trying to lengthen the terms for which government securities are available and promoting a market in Separate Trading of Registered Interest and Principal of Securities (STRIPS)

## 2.2 Choice at Two Levels

A potential buyer of term insurance in effect faces two inter-related decisions:

- Should he buy a term policy at all? If so, when and for what term and sum assured?
- Which product/ insurer he should choose?

Though it looks like putting the cart before the horse, it is more logical to explore the second choice first, for two reasons:

- The second problem is easier to solve

Given a desired product (in terms of sum assured, term etc), it is a simple matter to choose the insurer. The best option is the insurer who is willing to offer the policy to the specific buyer at the lowest premium. For example, one insurer might be willing to take on this risk and not another. Of course it is assumed that all insurers are comparable in terms of solvency. Therefore, a potential buyer simply has to start with the insurer offering the lowest premium and proceed down the list till he finds an insurer who is willing to accept his risk.

- After finding the best deal for each type of protection under consideration, the buyer can then decide which product suits him most. This is a much tougher decision, as it involves his disposable cash, tax status, coverage required and risk aversion.

In this paper, we focus on the following:

- For a given product, which insurer to choose?
- What is the ratio of the present value of expected benefits to expected premium payments?

This will give us the loading by an insurer towards administrative charges and profits. In effect, this is the extra payment the buyer is paying to avoid risk.

## 2.3 Choice of Insurer, for a Given Product

### 2.3.1 Data

A potential buyer needs data on the premium that would be charged by different insurers. This must be for the specific product, in terms of sum assured and number of years of coverage (term), applicable for his age. However, getting it is not that simple. A standard product brochure/ website of an insurer usually gives 'illustrative' premia, for some combinations of ages, terms and sums assured. Obviously, he would be lucky to find the premium for a policy exactly matching his requirements. He can contact the respective agents and get their exact quotes. Alternatively, websites of some of the insurers allow one to get an immediate quote for his specification or respond to requests for quotes through email. This could be time consuming. More practically, we can compare premia across companies for certain standard combinations that are readily available, and see which insurer is 'generally' the cheapest. We followed the second and third methods and compiled the data in the top

panel of Table 1. We considered the case of a 'healthy male'<sup>10</sup> of 30 yrs of age, sum assured of Rs. 500,000 and for terms of 5/10/15/20/25/30 years. Since the sum assured for the illustrated case in ICICI Prudential was Rs. 10,00,000, I was forced to proportionately adjust the premium for every Rs.100, 000 assured to make the premia comparable.<sup>11</sup>

### Findings

These adjusted, roughly comparable premia are in the bottom panel of Table 1. What are the main implications for an insurance buyer?

1. It pays to shop around and not to rely on what the agents/ insurance companies claim: please see the last column in the bottom panel titled "Max/ Min". These are the ratios of the maximums and minimums of the premia quoted by competing insurers for the same term and sum assured<sup>12</sup>. They are all above 2! Even accepting that our Tata-AIG quotes are high (because they are for a 35 yr male), what these ratios imply is that if you don't shop around for the cheapest policy, you may be paying double the going price.
2. The same insurer may not be the cheapest across all terms. For example, LIC offered the cheapest rate of Rs 228/- per Rs 100000 sum assured for a 10-yr term policy. But it may not be the cheapest for 10 and 15 yrs.
3. The last but one column gives us the cheapest premium going in the market for various terms. The corresponding entry is shown in **bold** in the body of the lower panel.
4. Given the wide spread in the quoted premia, one can expect further competitive reductions by insurers in the coming days.
5. There is a strong case for the IRDA to standardize the combinations of age/ term/ sum assured used by insurers for illustrations in their product brochures. Otherwise, consumers may be harmed.
6. It is perhaps wise to take a term policy for a short term like 5 yrs now, and take advantage of the falling premia due to the intense competition.

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<sup>10</sup> No male chauvinism by the author needs to be read between the lines. This is the most widely illustrated table in brochures and LIC's published 'ultimate' mortality tables are available only for 'healthy males'!

<sup>11</sup> Premia rate per Rs 100,000 assured are progressively slightly lower, for progressively larger sums assured.

<sup>12</sup> Please note that the data from Tata-AIG is for a 35-year-old male. Therefore, their quotes for a 30 yr male will be lower. However, their premia are so high that it is unlikely to make any material difference to our conclusions. Similarly,

**Table 1**  
**Comparison of Premiums as on Oct 31, 2002 for Pure Term Insurance for Ordinary Males**  
**Insurer**

	LIC	HDFC	ICICI Pru	Tata-AIG	Allianz Bajaj	Birla Sunlife	Max NewYork		
<b>Age</b>	<b>30</b>	<b>30</b>	<b>30</b>	<b>35</b>	<b>30</b>	<b>30</b>	<b>30</b>		
<b>Sum Assured (Rs)</b>	<b>500000</b>	<b>500000</b>	<b>1000000</b>	<b>500000</b>	<b>500000</b>	<b>500000</b>	<b>500000</b>		
<b>Term (yrs)</b>	<b>Yearly Premium (Rs)</b>								
5 NA			2455	2575	1655	1875	1190		
10	1140		2504	2585	1805	1875	1225		
15	1285	1510	2553	3010	2050	1875	1265		
20	1528	1535	2680	3450	2440	1905	1375		
25 NA				4160		1980	1600		
30 NA		1790							
<b>Sum Assured</b>	<b>100000</b>	<b>100000</b>	<b>100000</b>	<b>100000</b>	<b>100000</b>	<b>100000</b>	<b>100000</b>	<b>Best Deal</b>	<b>Max/ Min (Ratio)</b>
<b>Term (yrs)</b>	<b>Yearly Premium (Rs / 100000 sum assured)</b>								
5			245.5	515	331	375	<b>238</b>	238	2.16
10	<b>228</b>		250.4	517	361	375	245	228	2.27
15	257	302	255.3	602	410	375	<b>253</b>	253	2.38
20	305.6	307	<b>268</b>	690	488	381	275	268	2.57
25				832		396	<b>320</b>	320	2.60
30		<b>358</b>						358	

Notes:

1. TATA-AIG quotes are for 35 yr male. Their quotes for a 30 yr old will be lower.
2. SBI Life and ING Vysya do not offer a pure level term plan
3. Could not get data from the websites of Om Kotak Mahindra and ANP Sanmar
4. The premia per Rs 100000 assured is likely to be higher for ICICI Prudential as they are based on the quotes for a sum assured of Rs. 1000000.

## **2.4 What is the Loading for the Cheapest Term Insurance Product?**

### 2.4.1 Data

As discussed earlier, we need two sets of data, mortality rates and zero-coupon interest rates for various terms.

We need mortality rates for each year in the future, for a 30-year-old healthy male. For this, we use the mortality table published by LIC [1]. These mortality rates, shown in Table 2, are 'ultimate rates' applicable to 'ordinary males' for various ages between 30 to 60 yrs. For example, the entry of 0.00205 in the second column, in the row corresponding to 40 in the first column, means the following: If we consider 100000 insured ordinary males who are alive after reaching 40 yrs, 205 are expected to die during the next one year, that is, before they reach 41 years.

Compared to mortality rates among the general population, these mortality rates are only between 36 to 53% in the rural areas and 42 to 50% in urban areas, in the age group 30-60 [1, Annexure IX A]. Therefore, we would be grossly exaggerating mortality rates, if we use mortality rates for the general population, for estimating expected benefits from life insurance.

The LIC study could not find the expected pattern of differences between select and ultimate mortality rates [1. p.18]. Apparently, there is still a significant proportion of underreporting and rounding down of reported ages amongst issued policies. Therefore, we are not in a position to use select mortality rates. This is likely to exaggerate the estimated value of death benefits, especially in insurance policies of short tenures like 5 years.

For term structure of interest rates, we have used readily available estimates of term structure for gilts as of Nov 6, 2002, available at the website of the National Stock Exchange (NSE). Please see [3] for the methodological details of estimating these zero coupon interest rates. These are in Column 5 of Table 2. The term structure corresponding to AAA rated corporate bonds would be higher.

**Table 2**  
**Mortality Rates and Term structure of Interest Rates**

Age	Mortality Rate	Probability of Death at various ages for a male who is 30 yrs now	Probability of Being alive at the Beginning of next Year	Zero Coupon Interest rate as of Nov 6,2002 <sup>13</sup>
29			1	
30	0.00117	0.00117	0.99883	5.76%
31	0.00117	0.001169	0.997661	5.92%
32	0.00120	0.001197	0.996464	6.08%
33	0.00125	0.001246	0.995219	6.23%
34	0.00131	0.001304	0.993915	6.38%
35	0.00139	0.001382	0.992533	6.51%
36	0.00148	0.001469	0.991064	6.64%
37	0.00159	0.001576	0.989489	6.76%
38	0.00172	0.001702	0.987787	6.87%
39	0.00187	0.001847	0.985939	6.97%
40	0.00205	0.002021	0.983918	7.07%
41	0.00225	0.002214	0.981705	7.15%
42	0.00242	0.002376	0.979329	7.24%
43	0.00260	0.002546	0.976783	7.31%
44	0.00283	0.002764	0.974018	7.38%
45	0.00311	0.003029	0.970989	7.45%
46	0.00344	0.00334	0.967649	7.50%
47	0.00382	0.003696	0.963952	7.56%
48	0.00424	0.004087	0.959865	7.61%
49	0.00472	0.004531	0.955335	7.66%
50	0.00524	0.005006	0.950329	7.70%
51	0.00582	0.005531	0.944798	7.74%
52	0.00644	0.006084	0.938713	7.78%
53	0.00712	0.006684	0.93203	7.82%
54	0.00784	0.007307	0.924723	7.85%
55	0.00861	0.007962	0.916761	7.88%
56	0.00943	0.008645	0.908116	7.91%
57	0.01029	0.009345	0.898771	7.94%
58	0.01103	0.009913	0.888858	7.96%
59	0.01195	0.010622	0.878236	7.99%

<sup>13</sup> We are considering the case of a 30-year-old person. Therefore, the entry of 5.76% in this column in the row corresponding to 30 in Column 1 means that the one-year zero-coupon interest rate is 5.76%. As we go down this column, we get the zero coupon interest rates for 2 yrs, 3 yrs and so on.

## 2.4.2 Estimating Costs and Benefits from Term Insurance<sup>14</sup>

Let us take the case of a 30-year healthy male, considering a level term policy for a sum assured of Rs. 500000, for various terms: 5/10/15/20/25/30 years. Using the mortality rates discussed above, we first worked out the expected death benefits for various years into the future. These were discounted by the applicable zero coupon interest rates for Gilts (Column 5 of Table 2) to get the present values. Summing up all these present values over the term of a policy gave us what we call the 'Expected Present Value of Death Benefit (EPVDB)' for every Rs. 100000 sum assured.

We have assumed that our prospective policyholder will choose the cheapest policy as per Table 1 for the term desired by him. We have multiplied the premium by the chances that he would be alive in the beginning of a particular year (Column 4 of Table 2, one row above) to get the expected premium outgo that year. We discounted this by the appropriate zero coupon interest rate (column 5 of Table 2) to get the expected present value of the outflow that year. The sum of all such expected present values over the applicable term gave us what we call the 'Expected Present Value of Premia (EPVP)'. EPVP will change by a factor (between 1 to 0.8), corresponding to the tax rebate on the premium under Sec 88 of the income tax, available to the specific individual.

We defined two measures of loading or extra cost borne by a policyholder, both in percentage terms:

Measure 1:  $\{(EPVP-EPVDB)/EPDVB\} * 100\%$

This expresses the additional cost as a percentage of the expected present value of death benefits

This answers an important question of direct relevance to the prospective insurance buyer: how many additional rupees he has to pay for every 100 Rs of expected death benefit; in other words, what is the risk premium?

Measure 2:  $\{(EPVP-EPVDB)/EPVP\} * 100\%$

This expresses the additional cost as a percentage of the expected premiums received by the insurer.

This answers an important parameter of direct interest to the insurance company: What is the gross margin per 100 Rs. of premium collected?

We summarize our results in Table 3.

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<sup>14</sup> We have assumed that the premiums would be paid at the beginning of every year and that death benefits would be received only at the end of the year in which death occurred. This is a standard assumption in insurance literature.

**Table 3**  
**Loadings on Level Term Policy**  
**(30 yr old, healthy male, per Rs.100000 sum assured)**

	Term in Years					
	5	10	15	20	25	30
<b>Yearly Premium (Rs)</b>	238	228	253	268	320	358
<b>EPVDB (Rs)</b>	508.61	978.04	1455.64	1953.80	2495.18	3040.14
<b>EPVP (Rs)</b>	1056.24	1729.42	2459.09	2982.95	3854.51	4520.54
<b>Loadings</b>						
<b>Without any Sec 88 tax-rebate benefits</b>						
<b>Measure 1</b>	107.67%	76.82%	68.93%	52.67%	54.48%	48.69%
<b>Measure 2</b>	51.85%	43.45%	40.81%	34.50%	35.27%	32.75%
<b>With full 20% Sec 88 tax-rebate benefits</b>						
<b>Measure 1</b>	66.14%	41.46%	35.15%	22.14%	23.58%	18.96%

1. Yearly Premium is the lowest available in the market ('Best Deal' from Table 1)

### 2.4.3 Major Findings

1. From the buyer's perspective, even if he were to buy the cheapest available policy, the loadings (Measure 1) or risk premium seems to be very high. It gradually declines from a very high 107% on a 5-year policy to a low of 49% on a 30-year policy. This is in case he does not get any Sec 88 benefits on his insurance premium. This is the more reasonable measure as Sec 88 benefits can be availed through pure savings in PPF/ NSC/VPF etc also.
2. From the insurer's perspective, the loadings (Measure 2) or gross margins start with a high of 52% on a 5-year policy and gradually decline to 33% on a 30-year policy.
3. Both the above are consistent with the necessity for an insurer to amortize the initial expenses in marketing and establishing a policy to be spread over the entire term of the policy.
4. However, these loadings seem to be very high. Perhaps this explains the quantum reductions in premiums seen recently. This is likely to continue for some more time.
5. It is likely these measures of loadings actually underestimate the actual loadings. This is because we have used *ultimate* mortality rates from a *period* mortality table. We should be using the 30-yr old *cohort* mortality rate, including allowance for a lower *select* mortality in the first few years of the term. We are also not adjusting the mortality rates expected because of specific targets chosen by insurers.
6. Given the above, it may be beneficial for a potential buyer to postpone buying term insurance for very long terms. Instead, it might be prudent to buy short-term term insurance and wait for expected reductions in premiums<sup>15</sup>.

<sup>15</sup> Interestingly, Birla Sunlife made the lower premium applicable even to their existing policyholders, while announcing their reductions in premiums recently.

### 3. Implications

#### For Buyers

1. It pays to shop around and find the cheapest insurer. Ask the price quote for a pure term insurance policy for various terms. Do not allow an agent to clutter your thinking with fancy names, riders etc.
2. It is advisable to buy a term policy for a short duration, as the prices (premiums) are likely come down significantly in the next few years. The existing margins are too high.

#### Insurance Companies

1. They could target, if legally allowed, specific segments likely to experience significantly lower mortality rates. The basis of segmentation could be geographical/ income levels/ literacy levels and so on. Such targeting may also help achieve economies in marketing expenses.
2. Given the commodity nature of a level term policy, they could focus on the newly allowed corporate agency channel to push term policies. This would permit them to be more aggressive in their pricing, without sacrificing margins.

#### IRDA

1. IRDA should insist on industry standard combinations of age, term and sum assured etc., in illustrations used in product brochures/ websites etc to make it easy for a buyer to compare prices.
2. IRDA should assume responsibility of publishing mortality tables and thus provide reliable data to the public to help them judge the extent of loadings by the insurers. Now that it has ceased to be a monopoly, it is likely that LIC would be reluctant to do so in the future<sup>16</sup>.
3. IRDA should seriously consider sponsoring the development of a spreadsheet package, as a ready reckoner to choose the cheapest/best option available in the market for standard risks for each combination of age, sum assured, term etc. This can be hosted in its website as a public good available to all buyers.

#### Valuing More Complex Insurance Products

1. Finding the annual premium for the cheapest level term policy, for an identical sum assured and term, is often the first step in computing the expected return on the

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<sup>16</sup> According to LIC [1, p.30]:

*Awareness of mortality differentials will be an important element for our future business strategies and to retain the competitive edge. This also raises the issue as to which items of our data and the results of analysis can be made available to the forums outside the corporation. As a monopoly organization, so far the expectations have been that the mortality data of assured lives of the corporation should be made available to others for use in gratuity valuation, pension valuation, etc.*

- savings component of bundled products like whole life, endowment, money-back and unit-linked (variable) policies.
2. The general procedure is to subtract the level term premium identified above, from the annual premium payable for a bundled product. The balance is the incremental amount paid by the policyholder for a pure savings product. Then, we can use a standard analysis like for any other investments, without bothering about the insurance aspect.

#### Further Research

1. The first priority is to develop mortality tables for specific target segments of population. The real bottleneck will be data availability. This would be of tremendous utility to both buyers and insurers.
2. Development of a spreadsheet package, which can be marketed as a ready- reckoner for choosing the cheapest level term policy. This must use the detailed premia tables of each insurer for standard risks. Perhaps IRDA could sponsor the development of such a package and host it in its website. This could also be of use to insurance brokers, who are supposed to advice a buyer of the best choice available in the market to meet his insurance needs.

#### **References**

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