

COMPARING TRADITIONAL LIFE INSURANCE PRODUCTS IN THE INDIAN MARKET: A CONSUMER PERSPECTIVE

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ABSTRACT

Life insurance policies are valuable assets to mitigate the financial risk of untimely death. As such, every individual facing such a financial risk who can afford to pay for such a protection must seriously consider purchasing some life insurance. In the current Indian market, this choice is difficult on three counts:

- Inherent complexity due to uncertainty and long time horizons.
- The need to compare a plethora of different types of products from competing insurance companies.
- Most insurance policies bundle pure insurance with savings to offer composite products.

There are **two** broad types of life insurance policies available in the Indian market:

- **'Traditional'** products consisting of Term Insurance, Endowment and Whole Life Policies
- **'Modern'** products, which are unit-linked life insurance policies where the investment risks is borne by the policyholder.

This paper is an attempt at a comparative evaluation of the Traditional Insurance Policies available in the Indian Market from a consumers' perspective:

- Which type of traditional insurance product should I buy?
- Which insurance company's product should I buy?
- Is it better to save through insurance policies or through the widely available tax-advantaged Public Provident Fund (PPF)?

We use an expected present value approach, data on mortality rates, currently prevailing premiums on insurance policies and interest rates- for the comparison within and across policy types.

We conclude as follows:

- Shopping around will save a lot of money for an insurance buyer
- Term insurance should be the primary choice for insurance protection
- PPF is likely to be a better savings option than buying endowment or whole life policies

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1. Introduction

Life insurance is an appropriate financial tool for managing and mitigating the financial risk associated with untimely death. However, Life Insurance decisions are often complex. The choice of a life insurance product for an Indian Consumer is now a problem of plenty, even when confined to only traditional life insurance products—term insurance and cash value policies (i.e., whole life and endowment insurance). For any given product, we can choose from amongst several competing insurance companies. Depending only on a policy illustration provided by an insurance company can be a big mistake.

While comparing life insurance decisions, the concern of many financial planners is the quantitative assessment of the cost of protection against untimely death and the return on the savings component of the premium paid. Such an analysis can give a rational basis for comparing different Insurance Policies. In this paper, we perform such a comparison of traditional life insurance products. We propose to consider the unit-linked life insurance products in a follow-up paper.

2. Choosing a Policy

A buyer has to find a policy which best suits his needs. Some of the important questions he needs to ask himself are:

- Do I need protection for my entire life or for a specified period only?
- Is my current insurance protection adequate? If I were not around, what would my dependents need to maintain their quality of life?
- Should I create specific sums of money for meeting planned expenses? How much and by when?
- How much premium can I afford to pay?

It is difficult to apply any rule-of-thumb, because the amount of life insurance one individual needs depends on factors such as his/her wealth, sources of income, number of dependents, debts, and lifestyle and risk aversion.

In this paper, we do not venture into such questions. We restrict ourselves to a comparison of Insurance Policies for a given amount of death protection, term of protection, and/ or savings accumulation.

3. Valuation of Cash flows in Life Insurance

A series of cash flows at different points in time can be valued for their **Expected Present Value (EPV)**. The payments may include:

- 1) Benefits receivable under the policy
- 2) Premiums paid under the policy

The EPV depends upon the amount, timing, and the probability of uncertain events (mortality). For discount rates, usually a deterministic approach wherein the future interest rates are assumed to change in a pre-determined way is used. For mortality assumptions, we may use a life table function such as the one published by the Life Insurance Corporation of India (LIC), described below.

3.1 Mortality Table

An insurance company should know with reasonable accuracy the chance of death at each age. A mortality table gives an estimate of how many, out of the members of a group starting at a certain age, are expected to be alive at each succeeding age. It is used to compute the probability of dying in or surviving through any period. The mortality table should be appropriate to the group of lives being insured.

The Insurance Regulatory and Development Authority (IRDA) requires that the mortality rates used shall be by reference to a published table, unless the insurer has constructed a separate table based on his own experience. In this study, we are using LIC's 1994-96 (ultimate) mortality table².

3.2 Discount Rates

What discount rate should one use to value each cash flow? 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 a AAA-rated corporate bond, corresponding to the term of the policy. This practice is appropriate only if the term structure of interest rates³ 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. 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. In this paper, we are using the zero-coupon interest rate as on June 14, 2005, estimated as per the methodology outlined in the website of the National Stock Exchange of India (NSE).

4. Term Insurance⁴

A term insurance policy is a pure insurance product with no savings element. Term insurance provides financial protection against death within a specified period of time, paying a benefit only if you die during the term. Term policies will charge a lower premium than other types of insurance. This may be suitable for young people or for families on a limited budget that need

² 'Mortality Rates of Assured Lives in LIC of India' –LIC 1994-96 (ultimate), a mortality table of LIC, is to be used as the base table for pricing life insurance products. These mortality rates have been estimated by LIC based on their experience with policies in force during 1994-96.

³ 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).

⁴ This section merely updates the findings of an earlier paper by R. Rajagopalan (2003), "Valuing the Term Insurance Products in the Indian Market", TAPMI Working Paper Series No.2003/04.

a large amount of life insurance protection. For them, the affordability of the premium is likely to be an important consideration. An easy way to compare the term policies in the market is to find out the policy charging the cheapest premium for a given amount of protection and term. Since term insurance is almost a commodity-type product, the cheapest is often the best.

For illustrative purposes, we consider a 30-year male. He is considering a level annual premium term policy for a sum assured of Rs.10,00,000. Various terms under consideration are 5, 10, 15, 20, 25 and 30 years. We consider the twelve term insurance policies available in the Indian market in this paper⁵.

Table 1 highlights (in **bold**) the cheapest policy for each policy term.

Table 1
Comparison of Term Insurance Premiums
(Rs./Year)

S. No	Company	Policy	Term (years)					
			5	10	15	20	25	30
1	AMP Sanmar	Raksha Shree	2230	2230	2290	2600	3070	3640
2	AVIVA	Life Shield	2650	2660	2890	3120	3530	4060
3	Bajaj Allianz	Risk Care	3260	3560	4050	4830	6050	7750
4	Birla Sunlife	Term Plan	2950	2950	2950	3010	3160	----
5	HDFC	Term Assurance	2770	2820	2870	2920	3050	3430
6	ICICI Prudential	Life Guard	3032	3032	3032	3032	3334	3905
7	Kotak Mahindra	Term Assurance	----	3400	3400	3700	4100	4500
8	LIC	Amol Jeevan	2564	2564	2812	3227	3821	----
9	Max NewYork	Level Term	2160	2280	2430	2700	3050	----
10	Met Life	Suraksha	2700	2600	2800	3100	3300	----
11	SBI Life	Shield	2043	2043	2150	2454	2964	----
12	TATA AIG	Assure Life Line	----	3510	3970	4550	5280	----

It can be seen from the table that:

- SBI Life Insurance provides the cheapest policy for the first five terms, i.e., up to 25 years. For the 30-year term, HDFC Life Insurance is the cheapest.
- For some terms, the policies offered by some insurance companies can be more than twice as expensive as compared to the cheapest policy. While it is entirely possible that

⁵ The above premium rates are the annual rates in rupees charged per Rs.1, 000,000 Sum Assured for a male life currently aged 30. Premiums were collected from the websites of the insurance companies, using their respective 'premium calculator', as on 14th June 2005. This is true for all data in this paper.

underwriting standards⁶ may be more liberal and there may be some additional flexibility⁷ offered by such expensive policies, they do not seem to offer value for money for the buyer.

4.1 Estimation of Costs and Benefits

Assuming that one buys the cheapest policy available, does it offer value for money? We assume that the premiums are payable in the beginning of each year and death benefits will be paid at the end of the year of death. Our measure of estimated cost is the Expected Present Value of Premium (EPVP). Similarly, our measure of estimated benefits is the Expected Present Value of Death Benefits (EPVDB). These are defined below.

$$EPVP = \sum_{t=0}^{N-1} \left[{}_tP_x \times C_N / (1 + i_t)^t \right]$$

Where,

- N** : Term of the policy in years (5,10,15,20,25, or 30 years)
- T** : Year of payment of the premium $t = 0, 1, \dots, N-1$.
- ${}_tP_x$** : Probability of survival after t years of a person currently aged x
- x** : Age at the time of purchase of the policy (in our case, 30)
- C_N** : The applicable annual premium for a policy of term N years and a sum assured of Rs 10,00,000 (cheapest from table 1)
- i_t** : Zero-coupon interest rate for a term of t years

The numerator of each term within the summation gives the expected cash outflow in the t^{th} year and the denominator discounts it to the present.

Similarly,

$$EPVDB = 1000000 \times \sum_{t=0}^{N-1} \left[{}_tP_x \times q_{x+t} / (1 + i_{t+1})^{t+1} \right]$$

Where,

- q_{x+t}** : Probability that a person who is alive at age $x+t$ will die within the next one year.
- The numerator of each term within the summation gives the probability that a person, aged x when buying the policy, will die during the $t+1^{\text{th}}$ year. The denominator discounts the payment of death benefit (Rs. 10,00,000) to the present.

We define two **measures** of loadings or extra cost, both in percentage terms.

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

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

⁶ Criteria used by insurance companies to decide whether or not a person should be offered insurance; and if so, at what terms.

⁷ For example, option to buy additional coverage or to extend the term of coverage

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?

Table 2:
Loadings on Level Term Policy

	Term in years					
	5	10	15	20	25	30
Cheapest Premium (Rs/year) (From Table 1)	2043	2043	2150	2454	2964	3430
EPVP (Rs)	9048.55	15432.47	20785.58	27147.92	35465.22	43002.63
EPVDB (Rs)	5221.80	10219.44	15312.06	20732.55	26586.70	32369.03
Loadings						
<i>Without any tax benefits on premiums⁸ (figures in percentages)</i>						
Measure 1	73.28	51.01	35.74	30.94	33.39	32.85
Measure 2	42.29	33.77	26.33	23.63	25.03	24.72
<i>With 20% tax-benefit (figures in percentages)</i>						
Measure 1	58.62	40.81	28.59	24.75	26.71	26.28

From Table 2, it can be seen that Measure 1, i.e., risk premium, is the highest (73.28%) for a 5-year policy and the lowest at 30.94 % for a 20-year policy. Measure 2, i.e., gross margins for the insurer is the highest at 42% for a 5-yr policy and the lowest at 24% for a 20-year policy. Whether these loadings are acceptable or not depends on the risk aversion of individuals. Whether these are reasonable or not depends on the costs and reasonable profit loadings for an insurer⁹.

5. Endowment Policies

In an endowment policy, the benefit amount is payable either at the end of the term or upon the death of the insured person, whichever is earlier. Thus, an endowment policy is a bundle

⁸ Insurance premiums are eligible for deduction within the permissible limit of Rs 100000 along with some other investments. We are assuming a 20% tax savings on premium paid. This is irrelevant for Measure 2.

⁹ We plan to explore costs and profit margins in a later paper.

of insurance cum savings, providing death protection as well as a maturity benefit. These policies are for a fixed tenure, usually up to 25 years, and the policy holder pays a fixed premium periodically during the premium paying period.

Table 3 shows the premium structure of the endowment policies available in the Indian market¹⁰

Table 3
Premium Structure of Endowment Plans
(Rs. /Year)

S. No.	Company	Policy	Term in years					
			5	10	15	20	25	30
1	AMP Sanmar	Divya Shree	219240	100140	63920	45140	34330	27520
2	Bajaj Allianz	Invest Gain	220620	106020	64920	43620	31520	24120
3	HDFC Life	Endowment Assurance	----	100740	65070	47000	37070	29820
4	ICICI Prudential	Save n Protect	----	105455	65867	46133	34883	27907
5	ING Vysya	Reassuring Life Endowment (Cash Bonus)	----	96948	60300	43762	34779	28756
6	ING Vysya	Reassuring Life Endowment (Reversionary Bonus)	----	98093	63737	44857	33612	26493
7	Kotak Mahindra	Endowment Plan	--	101632	63295	44167	33184	26348
8	LIC	Endowment Assurance	208829	102275	66530	47955	37818	31368
9	Met Life	Suvidha (non-participating)	184610	84730	50160	32760	23160	17480
10	Met Life	Suvidha	---	----	62420	42990	31890	25550
11	SBI Life	Sudarshan	--	97646	60034	40356	29399	22735
12	TATA AIG	Assure Security & Growth Plan	----	151250	----	68170	---	39060

The simplest type of endowment policy is called, somewhat negatively, a 'non-participating' (non-par) policy. In reality, it is actually a 'guaranteed' policy under which the insurance company has to pay the sum assured of Rs 10 lakhs, irrespective of what happens to its investment incomes, actual number of policyholders who die etc. In other words, the

¹⁰ Aviva Life Insurance is offering an endowment assurance plan –Life Saver. But data is not available from the website.

insurance company bears all the risks. Naturally, the insurance companies are not very keen on selling this simple policy. Even if they do, they have to cover their financial risks by charging us a conservatively higher premium. Among the insurance companies, only Met Life is offering a non- participating policy.

All the other endowment policies are ‘**participating**’ policies. In a participating policy, the policyholder may get an additional sum of money called ‘**bonus**’, based on the surplus available in the funds managed by the insurer on behalf of the policyholder. Comparing participating endowment policies is therefore not straight forward. A non-participating endowment policy does not distribute to policyholders any part of its surplus. The premiums for non-participating policies will usually be lower than for participating policies.

5.1 Non-Participating Endowment Policy Vs Public Provident Fund (PPF)

A non-participating endowment policy offers only one additional benefit over a term policy: maturity benefit equal to the sum assured (S.A). From its premium, if we subtract the annual premium for the cheapest term insurance policy for the same S.A, the extra premium earns us this extra maturity benefit. Therefore, we can compare this with the alternative of investing this extra premium in the best available pure savings vehicle¹¹.

We must realize that it would be a mistake to subtract the premium for the corresponding term insurance policy offered by the same insurer. This is a very likely mistake, as we normally compare an endowment premium to the term premium of the same insurer¹². If their term insurance premium happens to be high, we may be talked up by the agent into buying their endowment policy instead. An endowment policy typically provides him a higher commission income.

In Table 4, we have calculated the loading on the extra premium of Met Life’s non-participating policy. We compare the expected incremental costs and benefits, with the cheapest term policy as the base: the Expected Present Value of the Extra Premium (EPVEP) versus the Expected Present Value of Extra Maturity Benefit (EPVMB).

We use the same expression for estimating EPVEP as for EPVP in Section 4.1. The only difference is that C_N will now be only the extra premium over the cheapest term insurance (Row 3 of Table 4). There is only one possible additional cash benefit- maturity value of Rs 10,00,000, if he survives the term.

$$EPVMB = 1000000 \times {}_N P_x / (1 + i_N)^N$$

For example, for the 10 year policy,
 $EPVMB = [1000000 \times 0.987088 \times 1 / (1 + 0.0715)^{10}] = 494603$, where ${}_{10}P_{30} = 0.987088$ and $i_{10} = 0.0715$.

¹¹ This is an application of a method called ‘Buy term and invest the difference’

¹² This is because an agent represents only one insurer.

From Table 4. we notice that longer the term, bigger is the loading. This implies that the non-participating policy becomes less and less attractive as the term becomes longer. The Public Provident Fund (PPF) is a long-term savings plan with attractive tax benefits. It enjoys the same tax benefits as insurance premiums in the year in which payments are made. A tax free interest at 8 % per annum is paid. Table 5 illustrates the accumulated values under PPF (AVPPF), if the above extra premium is invested in PPF rather than in the non-participating endowment policy for the respective time periods.

Table 4.
Loadings on Extra Premium of Met Life’s Non-Participating Policy

S.No.		Terms in Years					
		5	10	15	20	25	30
1	Premium for Cheapest Term Policy for the same term (From Table 1)	2043	2043	2150	2454	2964	3430
2	Non-Participating Endowment Policy Premium (Row 9 of Table 3)	184610	84730	50160	32760	23160	17480
3	Extra Premium (Row2-Row1)	182567	82687	48010	30306	20196	14050
4	EPV of Extra Premium (EPVEP)	808598	624603	464146	335266	241651	176147
5	EPV of the Extra Maturity Benefit (EPVMB)	721980	494603	329252	215028	137808	86430
Loadings (in %)							
6	Measure 1: [EPVEP-EPVMB]/EPVMB	11.99	26.28	40.97	55.91	75.35	103.80
7	Measure 2: [EPVEP-EPVMB]/EPVEP	10.71	20.81	29.06	35.86	42.97	50.93

Table 5.
AVPPF of Extra Premium of Non-participating Endowment Policy

Term in Years ¹³	Extra Premium (Rs/year)	Accumulated Value under PPF (Rs)
15	48010	1396393
20	30306	1480510
25	20196	1569970

¹³ The maturity period for a PPF account is between 15 to 25 years only.

For finding out AVPPF, we are compounding the annual extra premiums at 8% per annum. Since this extra premium will be paid only if the policy holder survives, we have multiplied by the probability of survival in each year. For ensuring a correct comparison, we have assumed that even if the PPF account holder were to die before the term, the money will be left in the account to accumulate till the end of the original term.

Thus the estimate of accumulated value under PPF (AVPPF) equals

$$AVPPF = \sum_{t=0}^{N-1} P_x \times C_N \times 1.08^{N-t}$$

Where,

C_N : Extra premium over the cheapest term insurance policy.

Please note that in each case, the maturity value far exceeds the maturity benefit of Rs 10,00,000 under the non-participating endowment insurance policy. As an alternative for savings accumulation, PPF definitely seems to be superior to the non-participating endowment policy.

5.2 Participating Endowment Policy Vs PPF

Assume that we invest the extra premium of participating policies over the cheapest term policies in PPF. Table 6 gives the estimates for the accumulated values of the extra premium if invested in PPF (AVPPF). To get the accumulated value of the extra premium of participating policies, we are using the same formula as in Table 5.

Table 6.
AVPPF of Extra Premium of Participating Endowment Policies

S.No.	Company	Policy	(Rs)		
			Term in years ¹⁴		
			15	20	25
1	AMP Sanmar	Divya Shree	1796609	2085298	2438289
2	Bajaj Allianz	Invest Gain	1825694	2011043	2220626
3	HDFC Life	Endowment Assurance	1830057	2176163	2651287
4	ICICI Prudential	Save n Protect	1853238	2133808	2481277
5	ING Vysya	ReassuringLife Endowment (Cash Bonus)	1691319	2017980	2473192
6	ING Vysya	ReassuringLife endowment (Reversionary Bonus)	1791286	2071473	2382474
7	Kotak Mahindra	Endowment Plan	1778430	2037765	2349202
8	LIC	Endowment Assurance	1872522	2222816	2709434
9	Met Life	Suvidha	1752980	1980266	2248611
10	SBI Life	Sudarshan	1683582	1851590	2054969
11	TATA AIG	Assure Security & Growth Plan	-----	3210360	---

¹⁴ The maturity period for a PPF account is between 15 to 25 years only.

The complication here is that participating policies may pay bonuses to policyholders out of their surpluses. These bonuses are typically reversionary, i.e., payable at the end of the term of the policy or on death of the life assured, whichever is earlier. Bonus declaration depends on the fund's investment performance and is not guaranteed. Bonus can be either simple reversionary bonuses (paid as a % on the sum assured only) or compound reversionary bonuses (paid as a % on the sum assured plus accumulated bonuses to-date).

For our comparison, we have assumed that all insurance companies are paying a compound reversionary bonus. In Table 7, we have worked out the minimum annual compound reversionary bonus rate required for the accumulated value under each policy (AVP) to be equal to the accumulation under PPF (AVPPF) as shown in **Table 6**.

$$AVP = 1000000 \times \left\{ \left[\sum_{t=1}^{N-1} \left[(1+b)^t - 1 \right] \right] \times P_x \times q_{x+t} \times 1.08^{N-t} \right] + (1+b)^N \times P_x \right\}$$

Where,

b : The constant annual compound reversionary bonus rate (in decimals) required for AVP to be equal to AVPPF of the extra premium of each policy¹⁵.

Table 7.

Minimum Required Compound Bonus Rate (in %)

S. No.	Company	Policy	Term in years			
			15	20	25	30
1	AMP Sanmar	Divya Shree	3.57	3.47	3.44	3.50
2	Bajaj Allianz	Invest Gain	3.67	3.28	3.07	3.00
3	HDFC Life	Endowment Assurance	3.69	3.69	3.78	3.81
4	ICICI Prudential	Save n Protect	3.78	3.59	3.51	3.55
5	ING Vysya	Reassuring Life Endowment	3.15	3.30	3.50	3.67
6	ING Vysya	Reassuring Life Endowment (Reversionary Bonus)	3.54	3.44	3.35	3.36
7	Kotak Mahindra	Endowment Plan	3.50	3.35	3.29	3.33
8	LIC	Endowment Assurance	3.85	3.80	3.87	4.00
9	Met Life	Suvidha	3.40	3.21	3.12	3.22
10	SBI Life	Sudarshan	3.12	2.87	2.76	2.77
11	TATA AIG	Assure Security & Growth Plan	----	5.70	---	4.83

¹⁵ We have used the GOAL SEEK function in Excel to compute the required value of *b* in each case. For example, accumulated value of extra premium of Bajaj Allianz Invest Gain policy for 15 years should be Rs.18,25,694. The sum assured for the same policy is Rs. 10,00,000. For AVP to accumulate to Rs.18,25,694, Bajaj Allianz has to pay a minimum of 3.67% of compound reversionary bonus each year.

Let us interpret the meaning of the entry of 3.85% appearing in the row for LIC under the column for 15 years. From the corresponding entry in Tables 6, we find that the extra annual premium for the participating endowment policy of LIC over the cheapest term policy will accumulate to Rs 18,72,522 at the end of 15 years, if invested in PPF. To achieve the same accumulated value, LIC has to declare a minimum compound reversionary bonus of 3.85% per year.

In each financial year, insurance companies will announce bonuses for their participating policies. Bonuses announced in recent years by the insurance companies will give us an indication of actual bonus rates. LIC announced *simple* reversionary bonus rates for 2003-04 of 5.1% to Rs 5.7 % for endowment policies¹⁶. Tata AIG announced a compound reversionary bonus of 3.5 % of the sum assured for 2004-05.¹⁷ Bajaj Allianz announced a compound reversionary bonus for 2003-04 of a total 2.3 % of which 1.8 % was the compound reversionary bonus and 0.5 % was a special bonus¹⁸. HDFC Standard Life Insurance has announced bonus of 2.75% in March 2004 for most policies. However, on its savings assurance plan the bonus was 3.25%¹⁹. ING Vysya declared individual compound reversionary bonus rate of 2% for 2003-04 for its Reassuring Life endowment plan²⁰. We note, for example, that Bajaj Allianz's required minimum bonuses are 3.67, 3.28, 3.07 and 3.00 % respectively for various terms. But the actual bonus announced by the company is 1.8 % (or 2.3% including special bonus). We must recognize that the future bonus rates may go up or down as these rates are not guaranteed.

However, accumulation through PPF has the following additional advantages:

- The contribution rates are flexible, requiring a minimum of only Rs 100/year.
- The term to maturity is flexible as the account holder can extend the term from 15 to 20 and then 25 years, depending on his future needs. In comparison, the policyholder can surrender the policy and take the surrender value before maturity.
- PPF is more secure
- PPF credits interest on a monthly basis which means the effective annual interest rate is approximately 8.3%. Here we have assumed an annual interest of only 8%.

6. Whole-Life Policies

In a Whole life policy, the sum assured with bonus is paid out either on death or survival till a pre-determined age. Whole life policies expire at age 100. A few expire earlier. For example, ING Vysya's Rewarding Life policy matures at 85 years. That means, on survival up to age 85, the sum assured and accrued bonuses will be paid to the policy holder. Whole life insurance policies are valuable because they provide permanent protection and accumulate cash values for emergencies or bequeaths. Since it is unrealistic to expect the policyholders

¹⁶ Business Line, September 16, 2004. Please note it is simple reversionary bonus and not compound.

¹⁷ Business Line, May 14, 2005

¹⁸ From Bajaj Allianz Website

¹⁹ Economic Times May 3 2004.

²⁰ From <http://www.ingvysyalife.com/bonusrates.htm>

to keep paying level annual premiums beyond certain age, most insurance companies provide an option to the policyholders to pay their premiums over a shorter term called premium-paying term. Table 8 gives the annual premiums on the six whole life insurance policies available in the market²¹.

Again, we find that there is only one non-participating whole life policy available in the Indian market: Met Life's Met 100. First, we will assess this non-participating policy for different premium paying terms. Accordingly, we estimate the expected costs as the Expected Present Value of Premiums (EPVP); and expected benefits as the Expected Present Value of Mortality Benefit (EPVMB), as given below.

$$EPVP = \sum_{t=0}^N \left[P_x \times C_N / (1 + i_t)^t \right]$$

Where,

N : Premium paying term in years

C_N : Annual premium for a premium paying term of N years

$$EPVMB = 1000000 \times \sum_{t=0}^{99-x} \left[P_x \times q_{x+t} / (1 + i_{t+1})^{t+1} \right]$$

Table 9 gives the results.

Table 8.
Whole Life Insurance Premiums (Rs/Year)

	Company	Policy	Premium paying term in years ²²		
			15	20	25
1	AMP Sanmar	Nitya Shree	36450	30000	26400
2	Bajaj Allianz	Life Time Care	29760	24710	22140
3	ING Vysya	Rewarding Life	44754	38358	35572
4	LIC	Jeevan Anand	76292	54274	41206
5	Met Life	MET 100(non-participating)	16900	14340	13030
6	Met Life ²³	MET 100 Gold	32070	26700	23760

We find that the loadings are very high. Since a whole life policy can be considered as an endowment till 100 years of age, this is in effect an endowment policy with a 70 yr maturity period for a person who is 30 yrs of age. As such these loadings are in line with our earlier findings on endowment policies that loadings tend to increase with term of coverage.

²¹ Aviva Life Insurance is offering a whole life plan –Life Long. But data is not available from the website. TATA-AIG, Max New York & HDFC are offering whole life policies but with single premium.

²² Premium paying term means the number of years over which premium is payable

²³ The quote is for 100,000 and proportionately adjusted for 1,000,000.

Table 9.
Loadings on Whole Life Non-Participating Policy

	Met Life's Non-participating Whole Life Policy	Premium Paying Term in years		
		15	20	25
1	Non-Par Whole-life Premium	16900	14340	13030
2	EPV of Non-Par Whole-life Premium (EPVP)	163384	158639	155908
3	EPV of Non-Par Whole-life Mortality Benefit (EPVMB)	56917	56917	56917
Loadings				
4	Measure 1: [EPVP-EPVMB]/EPVMB	187.05	178.71	173.91
5	Measure 2: [EPVP-EPVMB]/EPVP	65.16	64.12	63.49

The evaluation of participating whole life policies is a bit more involved. Since the premium paying term and the policy coverage term are different, we cannot follow the same method used in assessing participating endowment policies, using the cheapest term policy as the base. Instead, we use the non-participating whole life policy as the base. Suppose we invest the extra premium over the non-participating whole life policy (Met 100), in PPF for the premium paying term. What will be the accumulated value (AVPPF)?

$$AVPPF = \sum_{t=0}^{N-1} {}_tP_x \times C_N \times 1.08^{N-t}$$

Where,

N : Premium paying term in years

C_N : Extra premium over the non-participating whole life policy.

Table 10 gives our computed value of AVPPF.

Table 10.
AVPPF of Extra Premium of Participating Whole life Policies

	Company	Policy	Premium Paying Term in years		
			15	20	25
1	Amp Sanmar	Nitya Shree	568620	765022	1039339
2	Bajaj Allianz	Life Time Care	374038	506595	708181
3	ING Vysya	Rewarding Life	810146	1173328	1752340
4	LIC	Jeevan Anand	1727443	1950875	2190309
5	Met life	MET 100 Gold	441226	603811	834114

What is the minimum annual compound reversionary bonus rate (in decimals) required for the accumulated value under each policy (AVP), *valued at the end of the premium paying term*, to be equal to the AVPPF shown in Table 10? We have computed AVP as follows²⁴:

$$AVP = 1000000 \times \left[\sum_{t=0}^{100-x} [(1+b)^t - 1] \times {}_tP_x \times q_{x+t} \times 1.08^{N-t} \right]$$

The first term within the summation is the bonus if the policy holder dies between year t and $t+1$. The next two terms gives the probability of this event. The last term values the cash flow at N years. Since we are comparing the accumulated values as at the end of the premium paying term, we need to value all bonus related cash flows also at the end of the premium paying term. The interpretation of the entries in table 11 is on similar lines to the entries in Table 7.

Let us illustrate by discussing the meaning of the entry 2.38% for LIC's Jeevan Anand policy with a premium paying term of 20 yrs. LIC must pay a minimum of 2.38% as compound reversionary bonus, for this policy to be as good as PPF as an avenue for investing your extra premiums.

We also notice that the minimum bonus rate required goes up as the premium paying term gets longer²⁵. As is to be expected, larger the extra premium over Met 100, larger the minimum bonus rate required.

Table 11.
Minimum Required Compound Bonus Rate

S. No	Company	Policy	Premium Paying Term in years		
			15	20	25
1	Amp Sanmar	Nitya Shree	1.00	1.26	1.56
2	Bajaj Allianz	Life Time Care	0.71	0.91	1.17
3	ING Vysya	Rewarding Life	1.55	2.00	2.55
4	LIC	Jeevan Anand	2.21	2.38	2.53
5	Met life	MET 100 Gold	0.81	1.04	1.33

These have to be compared with the actual bonus rates announced by these companies in recent years. ING Vysya announced a 4% compound reversionary bonus for 2003-04. Bajaj Allianz announced a compound reversionary bonus of 1.2% for 2003-04. Life Insurance Corporation of India announced *simple* reversionary bonus rates for 2003-2004 of 4.9% to

²⁴ For ING Vysya, the summation goes upto 85-x only

²⁵ One of the reasons is that we are discounting all bonuses after the premium paying term to the end of the premium paying term @ 8%

5.3%. AMP Sanmar has declared a *simple* reversionary bonus of 6 % for 2004, inclusive of 2% as 'non-recurring'.

Though these seem higher than the minimum bonus rates in Table 11, we must remember that our base is the non-participating whole-life policy Met 100. We saw in Table 9 that the loading on this policy itself was around 180%. In addition, the quantum of bonus in future years is not guaranteed. Therefore, we can only say that, compared to Met 100 plus investments in PPF, participating whole-life policies seem equally attractive as an option for savings accumulation. But, as discussed earlier, PPF offers more flexibility and security.

7. Conclusions

On the whole, it seems that it is much better for an individual to buy the cheapest term insurance for the required amount of death protection (sum assured) and term. Instead of buying the only non-participating endowment policy available in the Indian market, it seems better to invest the extra premium in a PPF account.

The situation is not that clear cut between buying participating endowment policies versus buying the cheapest term policy and investing the difference in a PPF account. Inter-se comparisons between participating policies are difficult as they depend on the uncertain future investment performance and bonus policies of insurers. Instead, we have worked out the minimum compound reversionary bonus required under each policy for it to be equivalent to investing the extra premium in a PPF account. Considering the bonus rates in the recent years, in our assessment, PPF seems to be a much safer and flexible alternative investment for the extra premium.

In general, whole life policies are charging heavy loadings. A participating whole-life policy looks better only in comparison to buying a non-participating whole life policy and investing the extra premium in a PPF account.
