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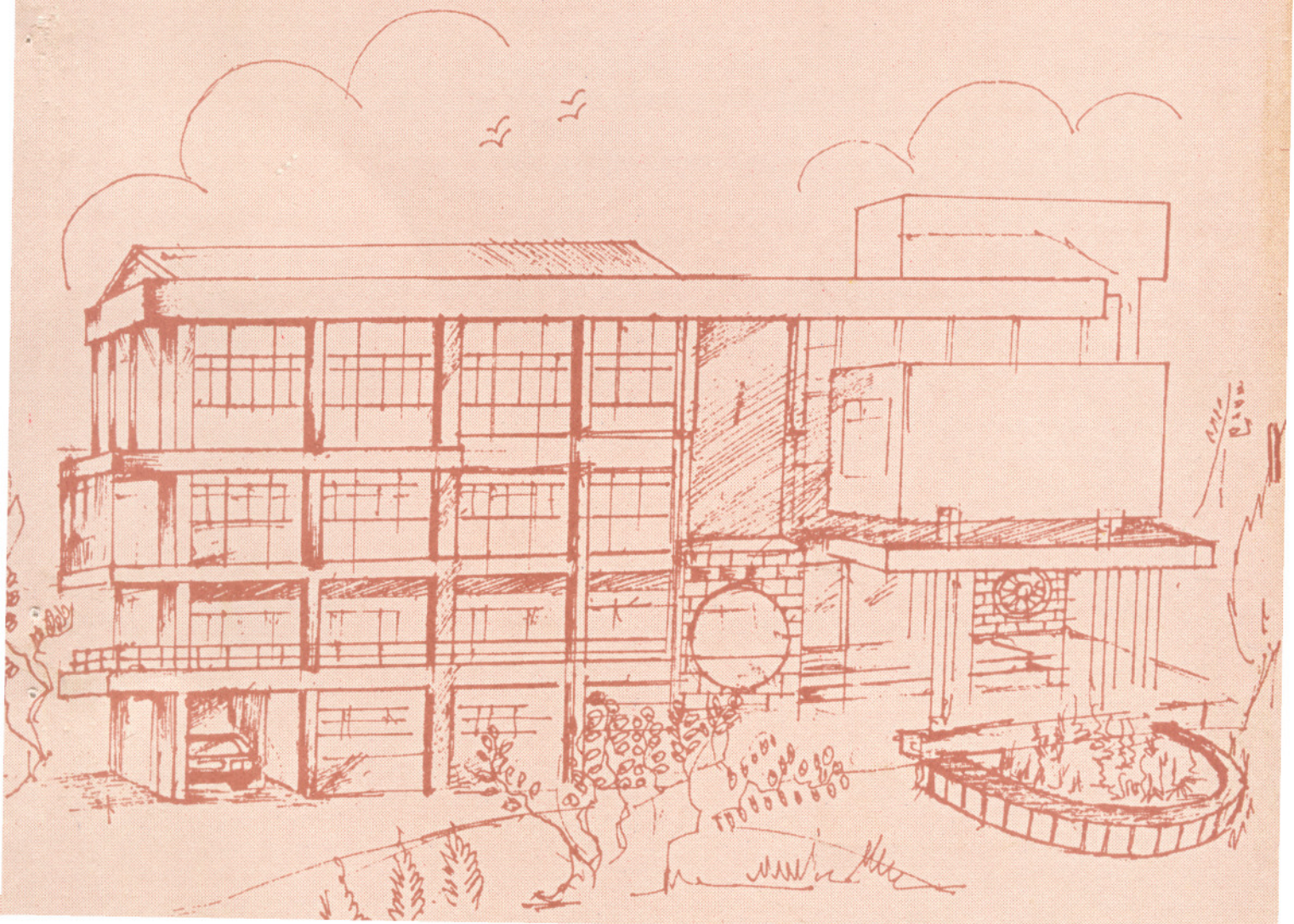
No. 52

Working Paper Series

Comparing Traditional Life Insurance Products in the Indian Market: A Consumer Perspective



Comparing Traditional Life Insurance Products in the Indian Market: A Consumer Perspective

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TAPMI WORKING PAPER SERIES NO. 2005/15

TAPMI

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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 risk 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 consumer perspective:

- Which type of the 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, current market premiums 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

We propose to follow this paper with a similar comparative evaluation of unit-linked policies.

Comparing Traditional Life Insurance Products in the Indian Market:
A Consumer Perspective

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. Different products have their own strengths and weaknesses, so trade-offs are always necessary. 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.

The concern of many financial planners while comparing life insurance decisions 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.

Though there are thirteen private players in life insurance, the Indian market is still dominated by the public sector Life Insurance Corporation of India (LIC). In this paper, we restrict ourselves to a comparison of traditional life insurance products. We propose to consider the unit-linked life insurance products in a follow-up paper.

2. 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 that the uncertain event upon which the payment will be made happens at the specified point in time. As regards

interest rates for discounting purposes, usually a deterministic approach is followed and the future interest rates are assumed to change in a pre-determined way. For mortality assumptions, we may use a (deterministic) life table function such as the one published by LIC, described below.

2.1 Mortality Table

An insurance company should know with reasonable accuracy the chance of death at each age. A mortality table shows 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 and for the valuation of corresponding cash flows. The mortality table used should be appropriate to represent the mortality of the group of lives being insured.

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. Such a table is to be made available to the insurance industry by the Actuarial Society of India (ASI), with the concurrence of IRDA. In the present study, we are using LIC 1994-96 (ultimate) mortality table (Appendix 1)[2].

Column 1 of the table indicates the age. Mortality rate is shown in the second column. Mortality rate at age x is the probability that a person attaining exact age x will die before attaining age x+1, i.e., if we say that the mortality rate at age 41 is 2.41 per 1,000, it means the probability that a person who is now exact age 41 will die before exact age 42 is 0.00241.

[2] 'Mortality Rates of Assured Lives in LIC of India' –LIC 1994-96 (ultimate), a mortality table of LIC is to be used as Base Table for pricing the Life Assurance Products. The mortality rates have been estimated by LIC based on their experience with policies in force during 1994-96.

2.2 Discount Rates

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[3] 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.

3. Choosing a Policy Type

One of the important problems faced by a buyer is deciding the best policy which suits his needs. Some of the important questions an individual needs to ask himself before choosing a policy 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 in order to maintain their quality of life?
- Do I have a need, apart from protection, to create specific sums of money for meeting planned expenses? What amounts are required and when?
- How much can I afford to pay by way of premium?
- What is the standing and financial health of the insurance company?

Experts do not agree about how much life insurance is enough. It is difficult to apply any rule-of-thumb, because the amount of life insurance one individual needs depends on

[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).

factors such as his/her wealth, sources of income, number of dependents, debts, lifestyle and risk aversion.

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

4. Term Insurance[4]

Term insurance provides financial protection against death within a specified period of time, paying a benefit only if you die during the term. Terms may be one or multiple years. Term policies tend to charge a lower premium than other types of insurance, and can be beneficial for those who are young or for families on a limited budget that need 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. If the goal is to get good value for money, a robust choice is to buy the cheapest premium or lowest load term insurance product.

For illustrative purposes, we consider a 30-year male. He is considering a level annual premium term policy for a sum assured of Rs.1,000,000. 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 paper.[5]

[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.

[5] Data gathered as on 14th June 2005, from the respective websites of the insurance companies.

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	----

- 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.

Table 1 highlights (in **bold**) the cheapest policy for each policy term. Since term insurance is almost a commodity-type product, the cheapest is more or less the best.

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 with the premium of Rs.3430.
- For some terms, the policies offered by some insurance companies can be more than twice as expensive as compared to the cheapest policies. While it is entirely possible that underwriting standards[6] may be more liberal and there may be some

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

additional flexibility[7] 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, given the prevailing mortality and interest rates? Here, we are assuming that the premiums are paid at the beginning of every year. The death benefits are available only at the end of the year in which death occurs.

We have multiplied the cheapest premiums for each time period of coverage (shown in bold in Table 1) by the chances that he would be alive in the beginning of a particular year (column 4 of Appendix 1) to get the expected value of premium paid. We discounted this by the appropriate zero coupon interest rate (column 5 of Appendix 1) 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 Expected Present Value of Premium (EPVP).

With the help of the mortality table- probability of death (column 3 of Appendix 1), we computed the expected death benefit for various years. Discounting these by the respective zero coupon interest rates (column 5 of Appendix 1) and summing up over the term of a policy gave us the Expected Present Value of Death Benefits (EPVDB).

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

We defined two measures of loadings or extra cost, both in percentage terms.[8]

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 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						
Without any Sec 88 tax-rebate benefits[9] *(figures in percentages)*						
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
With full 20% Sec 88 tax-benefit (figures in percentages)						
Measure 1	58.62	40.81	28.59	24.75	26.71	26.28

[8] R. Rajagopalan (2003), "Valuing the Term Insurance Products in the Indian Market", TAPMI Working Paper Series No.2003/04, p. 15.
[9] Insurance premiums are eligible for a 20% tax rebate under Sec 88 of the income tax act. This rebate is irrelevant for Measure 2.

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 are 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 insurer[10].

5. Endowment Policies

In an endowment policy, the benefit amount is payable either at the end of specified number of years or upon the death of the insured person, whichever is earlier. Thus an endowment policy is intended to provide death protection as well as a maturity benefit. One can view these policies as a bundle of insurance cum savings products. 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 as on 14th June 2005.

Unlike in the case of term insurance policies, the comparison across endowment policies is not straight forward. Most of the endowment policies are 'participating' policies. In a participating endowment policy, the policy holder may get an additional sum of money called 'bonus', based on the returns earned by the insurance company on the cash value invested on behalf of the holder. Non-participating endowment policy is a life insurance policy in which the company does not distribute to policyholders any part of its surplus. The premiums for non-participating policies will naturally be lower than for participating policies. Among the insurance companies, only Met Life is offering a non- participating policy.

[10] We plan to explore costs and profit margins in a later paper.

Table 3

Premium Structure of Endowment Plans

(Rs/Year)

			Term in years					
S. No.	**Company**	**Policy**	**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 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 are collected from the respective websites of the insurance companies- (using premium calculator) as on 14th June 2005.[11]

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

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

A non-participating endowment policy offers only one additional benefit over a term policy: maturity benefit equal to the sum assured (S.A). If we subtract the annual premium for the cheapest term insurance policy for the same S.A, the extra premium earns us this maturity benefit. Therefore, we can compare this with the alternative of investing this extra premium in the best available pure savings vehicle[12].

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 trap which most of us are likely to fall into, as we normally compare an endowment premium to the term premium of the same insurer[13]. 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 extra premium of Met Life's non-participating policy over the cheapest term policy for the respective terms.

[12] This is an example of a method called 'Buy term and invest the difference'
[13] This is because an agent represents only one insurer.

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 (Row 2- Row 1)	182567	82687	48010	30306	20196	14050
4	EPV of Extra Premium (EPVEP)[14]	808598	624603	464146	335266	241651	176147
5	EPV of the Extra Maturity Benefit (EPVMB)[15]	721980	494603	329252	215028	137808	86430
Loadings (figures in percentage)							
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

From table 2 we notice that longer the term, bigger is the loading.

The Public Provident Fund (PPF) is a long-term savings plan with attractive tax benefits. A tax free interest at 8 % per annum is paid. Table 5 illustrates the maturity values under PPF if the above extra premium is invested in PPF rather than in the non-participating endowment policy for the respective time periods. Please note that in each case, the

[14] EPVEP=$\sum$[Extra Premium$\times$ ${}_tp_x \times 1/(1+r_t)^t$] ,where ${}_tp_x$ is the probability of survival (column 4 of Appendix 1), r_t is the zero coupon interest rates (column 5 of Appendix 1) and t =0,1,2,3,…,N-1, where N is the term.

[15] EPVMB = [Sum Assured$\times$ ${}_Np_x \times 1/ (1+r_N)^N$] , where N is the term of the policy, r_N is the zero-coupon interest rate for N year tenure.
For example for the 10 year policy, the EPVMB= [1000000$\times$0.987088$\times$1/ $(1+0.0715)^{10}$] = 494603, where ${}_{10}p_{30}$=0.987088, r_{10}=0.0715.

maturity value far exceeds the maturity benefit of Rs 1, 000,000 under the non-participating endowment insurance.

Table 5
Accumulated Value of Extra Premium on Met Life's Non-Participating Endowment if Invested in PPF @ 8%

Term in Years[16]	**Extra Premium** (Rs/year)	**Maturity Value on Extra Premium** (Rs)
15	48010	1396393
20	30306	1480510
25	20196	1569970
30	14050	1684978

Column 2 of Table 5 indicates the extra premiums of non-participating endowment policy (Met Life Suvidha) over the cheapest term insurance policies for the respective years. For finding out the accumulated value of these extra premiums, we are compounding the respective values 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 fair 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[17].

As an alternative for savings accumulation, PPF definitely seems to be superior to the non-participating endowment policy of Met Life.

[16] The maturity period for a PPF account is a minimum of 15 years.

[17] Accumulated Value $=\sum[$ Extra Premium$\times 1.08^{N-t} \times {}_tp_x]$, where t =0,1,2,….N-1, where N is the term. For example, the accumulated value of extra premium for a 15-year policy i.e. 48010 is 1396393.

5.2 Participating Endowment Policy Vs PPF

Table 6 gives the extra premium of participating policies over the cheapest term policies.

Table 6
Extra Premium of Participating Policies over Cheapest Term Policies

(Rs/Yr)

			Term in years				
S. No.	**Company**	**Policy**	**10**	**15**	**20**	**25**	**30**
1	AMP Sanmar	Divya Shree	98097	61770	42686	31366	24090
2	Bajaj Allianz	Invest Gain	103977	62770	41166	28556	20690
3	HDFC Life	Endowment Assurance	98697	62920	44546	34106	26390
4	ICICI Prudential	Save n Protect	103412	63717	43679	31919	24477
5	ING Vysya	Reassuring Life Endowment(Cash Bonus)	94905	58150	41308	31815	25326
6	ING Vysya	Reassuring Life Endowment (Reversionary Bonus)	96050	61587	42403	30648	23063
7	Kotak Mahindra	Endowment Plan	99589	61145	41713	30220	22918
8	LIC	Endowment Assurance	100232	64380	45501	34854	27938
9	Met Life	Suvidha	-------	60270	40536	28926	22120
10	SBI Life	Sudarshan	95603	57884	37902	26435	19305
11	TATA AIG	Assure Security & Growth Plan	149207	-------	65716	-------	35630

Table 7 illustrates the accumulated values of the extra premium at 8%, i.e., if invested in PPF. To get the accumulated value of the extra premium of participating policies, we are using the same formula used in Table 5.

Table 7
Accumulated Value of Extra Premium on Participating Policies if Invested in PPF @ 8%

(Rs)

			Term in years[18]			
S. No.	**Company**	**Policy**	**15**	**20**	**25**	**30**
1	AMP Sanmar	Divya Shree	1796609	2085298	2438289	2889049
2	Bajaj Allianz	Invest Gain	1825694	2011043	2220626	2481296
3	HDFC Life	Endowment Assurance	1830057	2176163	2651287	3164881
4	ICICI Prudential	Save n Protect	1853238	2133808	2481277	2935460
5	ING Vysya	Reassuring Life Endowment(Cash Bonus)	1691319	2017980	2473192	3037279
6	ING Vysya	Reassuring Life Endowment (Reversionary Bonus)	1791286	2071473	2382474	2765883
7	Kotak Mahindra	Endowment Plan	1778430	2037765	2349202	2748494
8	LIC	Endowment Assurance	1872522	2222816	2709434	3350529
9	Met Life	Suvidha	1752980	1980266	2248611	2652792
10	SBI Life	Sudarshan	1683582	1851590	2054969	2315196
11	TATA AIG	Assure Security & Growth Plan	-----	3210360	---	4273009

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 (that is, at maturity), 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).

[18] The maturity period for a PPF account is a minimum of 15 years.

For our comparison, we have assumed that all insurance companies are paying a compound reversionary bonus. In Table 8 we have worked out the minimum compound bonus rate per annum (i.e., as a % of sum assured and accumulated bonus to-date) required for the accumulated value under each policy to be equal to the accumulation of extra premium if invested in PPF as shown in Table 7[19].

Table 8
Minimum Required Compound Bonus Rate

(In %)

			Term in years			
S. No.	**Company**	**Policy**	**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

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 entries in Tables 6 and 7, we find that the extra annual premium is Rs. 64380 for the participating endowment policy of LIC over

[19] Accumulated Value $=(\sum$ Sum Assured $\times[(1+x)^t-1)]\times {}_tq_x \times(1.08^{N-t}))+$ Sum Assured $\times(1+x)^N \times {}_Np_x$, t= 1,2,3,…,N-1. We are assuming that the extra death benefits will be accumulated till the end of the term, to value all cash flows on the same date
For example, accumulated value of extra premium of Bajaj Allianz Invest Gain policy for 15 year should be 1825694. Sum assured for the same policy is 1000,000. For the bonuses to accumulate to 1825694, Bajaj Allianz has to pay a minimum of 3.67% of the sum assured plus bonus to date each year.

the cheapest term policy. This will accumulate to Rs 1872522 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 the picture of actual bonus rates. Life Insurance Corporation of India announced simple reversionary bonus rates for its policyholders for the year ended March, 2004 of Rs 51 per thousand to Rs 57 per thousand for endowment type policies[20]. Tata AIG Life announced a compound reversionary bonus of 3.5 % of the sum assured for the financial year ended 2004-05.[21]. Bajaj Allianz announced a compounded reversionary bonus for 2003-04 for their main line of regular premium products like Invest Gain and Cash Gain of a total 2.3 % p.a. of which 1.8 % p.a. will be compounded reversionary bonus and 0.5 percent p.a. as a special bonus[22]. HDFC Standard Life Insurance has announced bonus on its policies for year ended March '04. For most regular policies, bonus is 2.75%. However, on savings assurance plan the bonus has been 3.25%[23]. ING Vysya declared individual policyholder bonus rates for financial year 2003-04 for its Reassuring Life endowment plan (with reversionary bonus) of 2% compound[24].

From Table 8, we can notice, for example, that Bajaj Allianz's required minimum bonuses are 3.67, 3.28, 3.07and 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 are not guaranteed. In addition, accumulation through PPF has the following 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.

[20] Business Line, September 16, 2004. Please note it is simple reversionary bonus and not compound.
[21] Business Line, May 14, 2005
[22] From Bajaj Allianz Wesite
[23] Economic Times May 3 2004.
[24] From http://www.ingvysyalife.com/bonusrates.htm

- 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

Whole life policies cover the insured for life. 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 early. For example, ING Vysya's Rewarding Life policy ends 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 that can be used for emergencies or to meet specific objectives. We consider six whole life insurance policies available in the market in this paper.

Table 9
Whole Life Insurance Premiums

(Rs/Year)

			Premium paying term in years[25]					
	Company	**Policy**	**5**	**10**	**15**	**20**	**25**	**30**
1	AMP Sanmar	Nitya Shree	96450	50250	36450	30000	26400	24200
2	Bajaj Allianz	Life Time Care	---	40980	29760	24710	22140	20790
3	ING Vysya	Rewarding Life	-----	-----	44754	38358	35572	-----
4	LIC	Jeevan Anand	242292	118071	76292	54274	41206	32573
5	Met Life	MET 100(non-participating)	-----	-------	16900	14340	13030	-----
6	Met Life[26]	MET 100 Gold	-----	-----	32070	26700	23760	---

- 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 are collected from the respective websites of the insurance companies- (using premium calculator) as on 14th June 2005[27].

[25] Premium paying term means the number of years over which premium is payable
[26] The quote is for 100,000 and proportionately adjusted for 1,000,000.

Again, we first consider the only non-participating whole life policy available in the Indian market. Table 10 shows the loadings on premium of Met Life's Met 100 non-participating policy for different premium paying terms.

Table 10
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: [EPVWP-EPVMB]/EPVMB	187.05	178.71	173.91
5	Measure 2: [EPVWP-EPVMB]/EPVWP	65.16	64.12	63.49

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 (70 yrs in this case).

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 can not follow the same method used in assessing participating endowment policies, using the cheapest term policy as the base. Instead, we use the extra premium over the non-participating whole life policies (Met 100) in Table 11.

[27] 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.

Table 11
Extra Premium of Participating Whole Life Policies over Non participating Policies

			Premium Paying Term in years		
	Company	**Policy**	**15**	**20**	**25**
1	AMP Sanmar	Nitya Shree	19550	15660	13370
2	Bajaj Allianz	Life Time Care	12860	10370	9110
3	ING Vysya	Rewarding Life	27854	24018	22542
4	LIC	Jeevan Anand	59392	39934	28176
5	Met life	MET 100 Gold	15170	12360	10730

Table 12 illustrates the accumulated values of the extra premium at 8%, at the end of the respective premium paying terms, i.e., if invested in PPF[28].

Table12
Accumulated Value of Whole Life Extra Premium if invested in PPF@8%

			Premium Paying Term in years		
	Company	**Policy**	**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

[28] Accumulated value = $\sum$Extra premium $*{}_tP_x * 1.08^{N-t}$, t=0,1,2,…,N-1, where N is the premium paying term

In Table 13, we have worked out the minimum compound bonus rate (i.e., as a % of sum assured and accumulated bonus to-date) required for the accumulated value under each policy, valued at the end of the premium paying term, to be equal to the accumulation of extra premium if invested in PPF as shown in Table 12.[29] The interpretation of the entries in table 13 is on similar lines to the entries in Table 8

Table 13
Minimum Required Compound Bonus Rate

			Premium Paying Term in years		
	Company	**Policy**	**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

7. Conclusion

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

[29] Accumulated Value = ($\sum$ Sum Assured $\times$ $[(1+x)^{t}-1)] \times {}_{t}q_{x} \times (1.08^{N-t})$), t= 1, 2, 3,…, 70. N is the Premium Paying Term and x is the required compound reversionary bonus rate in decimals.

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. Within whole life policies, non-participating whole life policy seems a better bet. Instead of buying a participating whole-life policy, it seems better to buy a non-participating whole life policy and invest the extra premium in a PPF account.

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Appendix 1

Mortality Rates and Term Structure of Interest Rates Used

Age	Mortality Rate[30]	Probability of Death at Various Ages	Probability of being alive at the beginning of the year	Zero coupon interest rate[31]
30	0.00117	0.001169	1	6.02
31	0.0012	0.0012	0.998831	6.19
32	0.00125	0.001251	0.997631	6.35
33	0.00131	0.001301	0.99638	6.49
34	0.00139	0.001383	0.995079	6.63
35	0.00148	0.001474	0.993696	6.75
36	0.00159	0.001576	0.992222	6.86
37	0.00172	0.001708	0.990646	6.97
38	0.00187	0.00185	0.988938	7.07
39	0.00205	0.002023	0.987088	7.15
40	0.00225	0.002216	0.985064	7.24
41	0.00241	0.002369	0.982848	7.31
42	0.0026	0.002552	0.980479	7.38
43	0.00283	0.002765	0.977927	7.45
44	0.00312	0.00304	0.975161	7.51
45	0.00344	0.003345	0.972121	7.56
46	0.00382	0.003701	0.968776	7.61
47	0.00424	0.004087	0.965075	7.66
48	0.00472	0.004535	0.960988	7.71
49	0.00524	0.005012	0.956454	7.75
50	0.00582	0.005541	0.951441	7.79
51	0.00644	0.00609	0.9459	7.82
52	0.00712	0.00669	0.93981	7.86
53	0.00785	0.00732	0.93312	7.89
54	0.00861	0.007971	0.925799	7.92
55	0.00943	0.008652	0.917828	7.94
56	0.01029	0.009354	0.909176	7.97
57	0.01103	0.009923	0.899822	7.99
58	0.01195	0.010635	0.889899	8.02
59	0.01307	0.0114899	0.879264	8.04
60	0.0144	0.012496	0.867775	8.06
61	0.01589	0.013594	0.085279	8.08
62	0.01761	0.014824	0.841686	8.10
63	0.01951	0.016135	0.826862	8.11

[30] LIC's Mortality Table 1994-96 (ultimate)
[31] From the website of the National Stock Exchange of India (NSE), as on June 14, 2005

64	0.02162	0.017528	0.810726	8.13
65	0.02273	0.018027	0.793198	8.15
66	0.02562	0.019857	0.775172	8.16
67	0.02882	0.021768	0.755315	8.17
68	0.03238	0.023751	0.733547	8.19
69	0.03628	0.025754	0.709796	8.20
70	0.04062	0.027787	0.684042	8.21
71	0.04539	0.02979	0.656255	8.22
72	0.05064	0.031722	0.626465	8.23
73	0.0564	0.033542	0.594744	8.25
74	0.06274	0.035209	0.561202	8.26
75	0.06964	0.036633	0.525993	8.27
76	0.07725	0.037802	0.48936	8.27
77	0.08549	0.038605	0.451558	8.28
78	0.09452	0.039032	0.412953	8.29
79	0.10433	0.039012	0.373921	8.30
80	0.115	0.038514	0.334909	8.31
81	0.12654	0.037507	0.296396	8.32
82	0.13906	0.036002	0.258889	8.32
83	0.15108	0.033674	0.222886	8.33
84	0.16228	0.030705	0.189213	8.34
85	0.17415	0.027604	0.158507	8.34
86	0.18664	0.024432	0.130903	8.35
87	0.19977	0.02127	0.106471	8.35
88	0.2136	0.018199	0.085202	8.36
89	0.22792	0.015271	0.067002	8.37
90	0.24312	0.012577	0.051731	8.37
91	0.25889	0.010137	0.039154	8.38
92	0.27505	0.007981	0.029017	8.38
93	0.29193	0.006141	0.021036	8.39
94	0.3099	0.004616	0.014895	8.39
95	0.3274	0.003365	0.010279	8.40
96	0.34559	0.002389	0.006914	8.40
97	0.36629	0.001657	0.004524	8.41
98	0.38298	0.001098	0.002867	8.41
99	1	0.001769	0.001769	8.41