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How much Pension is enough?

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(Subject Code 03 – Subject Group : Pensions and Social Security)

1. Not Enough Pension Income

"…In Michigan many teachers live on a fixed pension -- I do --with no cost of living increases. What I live on will remain fixed for the rest of my life.

I know this is also true in other states. For most retired people a pension is not enough. We couldn't live on ours….Mike Michelozzi, Michigan"

The above message is not out of any single specific situation or scenario…this has become a global issue, particularly, if we talk about the third world countries. The countries of Asia, Central Asia and Europe, together with much of the developed world, face a potential financial and health crisis unless they respond promptly to a profound demographic change taking place in the society- the widespread ageing of their populations.

85 percent of the world population has no formal pension coverage as per the finding of New Idea About Old Age Security published be the World Bank. Latin America and countries of the former USSR are the worst hit by `pension privatisation`. `Reforms ` have centred on reducing social contributions and funding pensions out of stock market earnings. UK pension funds hold stocks market investments for 18 months, down from 23 years in the 1960s.

World-wide, there are now approximately 600 million living over the age of 60. By 2020, this number would increase to more than one billion. For the countries of Europe and Central Asia, the elderly would constitute almost 20 percent of the regional population by 2020.

In this age, people live longer because of better housing, sanitation, hygiene, nutrition, and medical advancement. Better medical care initially reduced infant mortality, now it contributes to better health and longer life for older people.

2. Affording Retirement:

The goal of most retirees is to maintain the same standard of living after retirement as they enjoyed before retirement. The percentage of pre-retirement income that is needed after retirement to achieve that goal is called the **Replacement Ratio.**

In most countries, the funding of pension is from resources drawn from three pillars:

- The 1st pillar – the compulsory, pay-as-you-go, state pension, a basic pension component to keep retirees above the poverty line. This pillar contains an element of income distribution. Keeping the elderly above the poverty line involves some redistribution of income from higher to lower wage earners.
- The 2nd pillar – the supplementary (often funding-based) occupational pension i.e. individual accounts, which would fund fully the larger part of pension obligations.
- The 3rd pillar – individual savings (personal pension and assets and life insurance), voluntary accounts as desired, based on voluntary private insurance or annuities.

The relative importance of these different sources varies among retirees for several reasons.

Perhaps the most important lesson is that no one can rely on government benefits alone to finance retirement. Meeting any reasonable retirement income goal requires at least a portion of the money come from either an employer-provided pension or personal savings.

Knowing how much an individual would need to fund the lifestyle during retirement is important because people now expect to live 20 or more years after retirement.

To get started, basic target set for an individual would depend largely on the following parameters;

- What are his investment goals?
- How long would he have to invest? –The time horizon
- How long he expects to live in retirement?
- How much risk he is willing to take? Can he accept a lot of fluctuations in the value of his investment for potentially higher returns? If so, he might consider stocks. However, when the markets begin to fall, he feels anxious and might want to consider fixed-income investments.

3. Funding Retirement

Because it may be hard for the individuals to imagine him self retired, it may be even harder to think about where the money for retirement will come from. Traditional methods for funding retirement, such as Bank Deposits, cumulative savings schemes and other retirement benefits, may not meet all his financial needs — especially when people are living longer and retiring at an earlier age.

4. The Retirement Goal- what Gurus say!

Most of us know by now: living longer, the declining value of the state pension and lack of any company rendered post retirement income benefits; we have to accumulate more wealth during our working life.

But just as importantly - and in the words of the latest regulatory-speak - we need to know how to "decumulate" our wealth when we retire. In plain language that means: ensuring that we use it effectively to generate enough long-term income so that we don't end up cash strapped in our retirement Years.

Most people look to Social Security, a pension, and personal savings to fund their retirement. But what happens if these retirement benefits don't suffice up to the bare minimum necessity, far from reaching comfort?

There's not much we can do about Social Security or a pension — those benefits are outside our control. But we can do to have some say over our own personal savings, particularly a retirement plan.

Conventionally, during retirement planning, as the rule of thumb, people are advised to save up to a stipulated level throughout their working life. What ever percentage it says, in order to attain the replacement ratio, there would obviously a short fall. Here, the planners say there are ways to make up that shortfall;

5. Four Ways to fill the gap for a Shortfall

The following strategies can help in coming up short of one's retirement goal.

- **Save More**
  Contributing a little more money each month to retirement savings plan may help to meet income goal, especially if we have a moderate to long investment time horizon (10 years or more).

- **Invest More Aggressively**
  Many retirement investors fall into the trap of choosing so-called "safe" investments. While there is a place for capital preservation investments in a retirement portfolio, placing too much reliance on them can result in lower potential compound growth over time. Selecting investments with the potential to earn a higher average annual return may help to close the gap without sacrificing the lifestyle (of course, the more aggressively one invests, the greater is the potential risk).

- **Reduce Income Goal**
  Another way to reduce the shortfall is to reduce the retirement income goal. It is not as appealing as saving more or investing more aggressively, but s a possible solution.

  But one point always to be considered that the financial planners suggest the maintenance income equal to at least 50% to 70% of final working pay to maintain current standard of living in retirement.

- **Plan to Retire Later**
  Delaying your retirement date is another alternative. Doing so gives an individual more years to save and less retirement years to live.

6. The Replacement Ratio

Replacement ratio is derived from the following formula:

Replacement Ratio = Post-Retirement Expenditures / Pre-Retirement Expenditures.

The idea behind this formula is that an individual's entire gross income is used for many types of expenditures. Generally, expenditures are taxes, housing, financial products, consumer goods, food, transportation, family-related, personal expenditures, entertainment, travel and savings. It is seen that, after retirement several of these expenditures change, for example, a mortgage may be paid off by retirement thereby alleviating this calculated expense. An individual's income will most likely decrease, resulting in a downward shift in their tax bracket and taxes less during retirement. The family's children will most likely be through their education, and supporting themselves. These are examples of how expenditures can change and, as is evident, they can be quite unique to each individual family. It may also happen some times that after retirement individuals aspire to have better life style. Tours to pilgrimage centres or to relatives at far off places are undertaken after retirement. Individuals may prefer to stay in hotels rather than with relatives during their visits. This will mean a change in assumptions about the life style after retirement

The annual retirement income from the nest egg (i.e. the retirement savings) partially "replaces" the money one is making when working.

7. Built up of the Corpus

How much money will be available each year in retirement depends on the following factors;

- **Tax**: Regular contributions to retirement plan money may look like a lot while calculating but are subject to tax deduction.
- **Life Span after retire** : The first unknown factor is how many years one will live in retirement. Medical research is helping in extending human life span; some breakthroughs in medicines may help the process considerably.
- **Inflation Rate**: The second variable is the inflation rate when one is retired. This would depend mainly on how the various Governments run their economy.
- **Amount of Investment Returns** — The third variable is the amount of investment returns expected on savings to earn in retirement.
- **Size of the Nest Egg** — the fourth variable is how big the nest egg is going to be — the estimated value of the personal retirement savings net of tax..

- **Individual Spending Rate** — The fifth variable is the individual spending rate. Some people have other resources to help in retirement, such as other savings and investments, a spouse who's still working, or an inheritance. Such cases would be a small percentage of the total retiring group. Social Security should also provide people some support in retirement. To figure out how much one can afford to spend every year in retirement, it is necessary to take all these sources of income into account.

7. Converting Estimated Future Worth to an Annual Replacement Income

The annual retirement income from the nest egg partially "replaces" the money individuals were making when working. In India , as the world bank research studies shows, about 34 million (or less than 11%) of the estimated working population in India is eligible to participate in formal provisions available to provide old age income security. A study by world bank on India reveals that;

- Currently there are estimated 11 million member/workers for whom Government pays DB Pensions
- while most private Companies & PSE's pay through EPF which covers around 21.5 million members,
- some private sector have own Provident Fund in which 4.6 million members are there in exempt schemes.
- The present size of the labour force is 324 million
- Only 1 in 10 Indian workers participates in a pension scheme
- 50% of population has negative savings

Source:http://wbln0018.worldbank.org/, Robert Palacios, The World Bank http://www.id21.org

In India the Govt. Welfare and Social security system is totally state run.
The current scenario:

- In India, there is Unfunded (PAYGO) Pension system for the working population at the Government level across all the sectors. The burden of PAYGO is proving heavy.
- Employees' Provident Fund (EPF)* scheme covers workers engaged in private organized sectors. But it can not offer adequate pension on retirement , as workers are permitted to withdraw from the fund for various reasons and most of them do withdraw from the fund.
- The funded and DB type EPS'95 effective 1995, even with its limitations, does not cover all employed sector.
- Self-employed sector has no mandated accumulation system at all. There are no incentives for the sector to save for retirement. This sector is large. The Agricultural and other non-corporate sector contributed 65% of the share of the national income in the year 1999-2000.

8. So, let us take a view of what Pension Products India has now?

Compulsory Programmes:

- o PAYGO Pension Plans for Government employees, Govt.employees, in addition to their pension benefits are also covered under the General Provident Fund (GPF) scheme. The GPF is a non-contributory program

where only workers themselves contribute a minimum of 6% of their monthly earnings. The accumulation under the GPF account is returned to the worker in lump sum at the time of retirement. The pension benefit is Employer contributions based.

- ITR exempt – Defined Benefit (DB) type Pension Funds, the central government alone administers separate pension programs for civil employees, defence staff and workers in railways, post, and telecommunications departments. Non-contributory from the part of the employees.

- Employees' Provident Fund (EPF) scheme- covers workers engaged in private organized sectors. Employers with 20 or more employees are required to participate and contribute to the EPF as either exempt or non-exempt funds. Exempt funds are permitted to administer their funds separately. The employees Provident fund Organization (EPFO) administers the un- exempt funds. The employer and employee both contribute to this program.

- A large number of public and local bodies and autonomous institutions run their own pension schemes guaranteed by the government.

- Part B of Fourth Schedule Approved Superannuation Funds – for individual and group

- EPS'95- Employees in firms with more than 20 employees, Employer government contributions

- Specifically legislated Pension Funds: Certain occupation and employees in Jammu & Kashmir, employer-employee contribution

- The Gratuity Act 1972 requires that, employers with more than 10 employees to provide a lump sum equal to 15 days salary for each year of service subject to maximum of Rs.350,000.

- Employees' Deposit Linked Insurance Scheme: No amount is recovered from employee's wages. Employer should pay 0.5% of total wages subject to a ceiling of Rs. 6500/- per annum (w.e.f. 1-06-2001).This is a term insurance cover available during service.

- Group Insurance Scheme in lieu of EDLI (The Employees Deposit Linked Insurance): Employers are required to contribute 0.5%. Employees Deposit Linked Insurance scheme is applicable to all establishments and undertakings contributing employees' Provident Fund under the EPF and MP Act, 1952, with effect from 1.8.1976, unless exempted under Section 17(2A) of the Act. The scheme provides for an insurance cover to an employee linked to his balance in the PF Account subject to a maximum of Rs.60, 000/-(Sum Assured depends on 'notional balance' in P.F., calculated on the basis of the salary and Past Service). The Act empowers the Central Provident

Fund Commissioner to exempt an employer from EDLI if he opts for a Group Insurance Scheme of the LIC which is more beneficial to the employees.

- Group Gratuity Scheme**:** Gratuity is a statutory liability of most of the employers which accrues to an employee for every year of service put in by him. Employer's contribution. The funding of the Gratuity benefits can also be made on Cash Accumulation basis, whereunder the fund is accumulated at a rate of interest, (varied from 10.75% to 12.00% depending on the size of the fund during 2001-02.)

- Group Superannuation Scheme: The Group Superannuation Scheme is to provide pension to the employees on their retirement from service. The scheme may be financed by the employer alone or jointly with the employees. A decreasing group insurance cover in conjunction with superannuation benefits may also be provided under the scheme.

  The Scheme is of two types :-a) *Money Purchase Scheme,* b) *Benefit Purchase Scheme*

- Voluntary Retirement Scheme (LIC's Plan): The benefits under VRS are normally decided by the employer/ management. Generally, they provide for payment of annuity till the normal retirement age is reached

9. Voluntary Tax –preferred

- Private Pension schemes offered by Life Insurance Corporation and other insurers
- Private Pension Funds
- Private annuities: Deferred and immediate annuities offered by Insurers- Purchase of Annuity products
- Public Provident Fund- Employee Contribution

Social Assitance

- State Level assistance-financing from state budget
- National old age Pension Scheme - covers Destitute persons over age 65, financing from Central budget

10. Cost for Financing and sustainability:

- **Towards EPF and EPS**

Form of Benefit: Who Pays what

	Employer	Employee	State	Total
1) Provident Fund	12% of which 8.33% is diverted to EPS, 3.67% (Under RPFc)	12%	Nil	15.67%
	12% (under trusts and funds)	12%		
2) Employee Pension Scheme(EPS)	8.33%	Nil	1.16%	9.5%

3) Gratuity Scheme providing lumpsum equal to 15 days salary for each year of service subject to max. of 350,000	Actuarially determined cost	Nil	Nil	Actuarially determined cost
(1) and (2) above refer to state Scheme with a salary limit of 6500/- per month. Private schemes can be set up either as exempted funds or as funds for employees not covered by the EPF Act in terms of Income Tax Act 1961.				

Source: article by Sri. N.R Kapadia,Problem of old age income security-an Actuarial assessment, P 55, Forte Newletter

- In addition, employers must pay a charge of 1.1% of payroll to the EPF/EPS to cover costs of administration
- Exempted funds pay another 0.18% of payroll to cover cost of inspection.

	Employees' Provident Fund (EPF)	**Employees' Pension Scheme (EPS)**	**Government Employees' Pension Scheme (GEPS)**
Coverage	The scheme covers workers in the private organized sector.	EPF members with monthly earnings not exceeding Rs. 6500 per month	The scheme covers government employees.
Contribution	Employees contribute 10% or 12% of monthly wage. Employer also provides a matching contribution, out of which an amount in excess of the EPS contribution is credited into the worker's EPF account.	Out of the employer's contribution into the EPF, 8.33% of earnings is diverted into EPS. Maximum earnings for EPS contribution is Rs. 6500 per month. The government also makes 1.16% contribution.	Participants make no explicit contribution but they forego the employer's contribution into their provident fund accounts.

11. Now coming back to the key issue of converting estimated future worth to an annual replacement Income

The amount of retirement income it takes to be equivalent to pre-retirement income levels is adjusted for taxes; expenses related to work that reduces upon retirement and the portion of income before retirement that had been allocated to saving for retirement. Research studies shows in USA that at all income levels, an income of between 75% and 80% is required to maintain the pre-retirement standard of living. While in Canada, maintenance income is assessed to be 70% of pre-retirement income to support a similar lifestyle after retirement. While in India, we assume the maintenance income at 50%.

12. How much is enough?

We will try to examine a person's replacement income and the savings required for maintaining that replacement income with varied accumulation interest rates of 5, 6 and 7 percent.

We have taken a hypothetical situation of a professional aged 30 working in a company where there is no provision for retirement;

As per normally perceived retirement age, he is slated to retire at age 60. So, there is still 30 years period to his retirement His current annual income is assumed to be Rs. 120,000 with an anticipated average increase of 5 per cent per anum. Approximate savings from salary are taken as 10 per cent per anum, which may accumulate at a rate of 5 per cent, 6 per cent and 7 percent

per anum. We presume that he will have a continuous employment period, that he will meet from his earnings his housing needs, education needs of his children, family sickness expenses, perceived obligations to his parents etc and still save 10% of his gross salary for building up pension corpus.

As calculated,(Same annuity rates are assumed for males and females)

	Salary at 60 (Rs.)	Salary at 60 (Rs.)	Salary at 60 (Rs.)
Annual gross Income at age 60	518,633	518,633	518,633
	Accumulation interest rate 5% (Rs.)	Accumulation interest rate 6% (Rs.)	Accumulation interest rate 7% (Rs.)
Savings at the time of Retirement	`16,88,147	19,71,671	23,15,736
Notional cash Lump-sum @ 25% of the savings before purchasing annuity	4,22,037	4,92,918	5,78,934
Cash amount available for purchasing annuity	12,66,110	14,78,753	17,36,802

If he purchases an immediate annuity at the Retirement age his approximate annual Pension would be;

Annuity Option 1	**Annuity Income @ savings rate 5%**	**Annuity Income @ savings rate 6%**	**Annuity Income @ savings rate 7%**
Immediate pa	116,102	135,602	159,265
Immediate with 3% pa simple Increases	95,085	111,054	130,434
Joint Life Last Survivor pa	104,581	122,145	143,460
Immediate pa with Return of Capital	86,729	101,295	118,971

[1] An annuity is a contract in which an insurance company makes a series of income payments at regular intervals in return for a premium or premiums paid. Annuities are most often bought for future retirement income. Rates calculated on LIC Immediate annuity rates.

2. Factors influencing annuity rates: the most important factors are mortality, expenses, investment yields, annuity basis and competitive positioning in the annuity market place.

The annuity will be payable in monthly instalments The annuity amount calculated above is no where near to his replacement income i.e. Rs 2,59,317 or Rs.2,49,317 (monthly Rs.20,776.) after allowing for medi claim premium of Rs. 10,000 for self and spouse.

If, he can increase somehow his savings from currently 10 per cent to 20 per cent, then also the income from annuity remains far from reaching the magical figure of replacement income milestone if interest earned on investment is

either 5% or 6% and annuity option allows for 3% simple increase pa to partially compensate for inflation or a joint life and last survivor annuity is purchased. It may be mentioned that a steady saving of 20% pa after meeting all committed expenditures throughout life phases is seemingly impossible for most of the income earners.

13. Reducing the GAP

In order to reduce the gap between the desired pension and the available pension, we assume the individual earner retires late by two years. This means he is depriving himself of two years of retired life and also that a suitable employment is available to him at his age 60, even though with the same salary for a further period of two years. This would amount to a compromise in life style.

The calculations below are illustrative.

(Same annuity rates are assumed for males and females)

	Salary at 60&62 (Rs.)	Salary at 60 &62 (Rs.)	Salary at 60&62 (Rs.)
Annual gross Income at age 60 & 62	518,633	518,633	518,633
	Accumulation interest rate 5% (Rs.)	Accumulation interest rate 6% (Rs.)	Accumulation interest rate 7% (Rs.)
Savings at the age of 60 yrs	16,88,147	19,71671	23,15,736
Savings at the age of 62 years	19,72,817	23,28,618	27,66,157
Notional cash Lump-sum @ 25% of the savings	4,93,204	5,82,155	6,91,539
Cash amount for purchasing annuity	14,79,613	17,46,463	20,74,618
Annuity Option	Annuity Income @ savings rate 5%	Annuity Income @ savings rate 6%	Annuity Income @ savings rate 7%
a.Immediate pa	1,41,007	1,66,438	1,97,711
b.Immediate with 3% pa simple Increases	1,16,594	1,37,621	1,63,480
c.Joint Life Last Survivor pa	1,26,359	1,49,148	1,77,172

d.Immediate with Return of Capital	1,02,389	1,20,855	1,43,564

[1] **Factors influencing annuity rates**: the most important factors are mortality, expenses, investment yields, annuity basis and competitive positioning in the annuity market place.

The annuity will be payable by monthly instalments. From the above annual annuity figures, Rs 10,000 need be deducted first every year for paying medi-claim insurance premium for the employee and his/her spouse.

14. Some Observations

In the above calculations, we have estimated basically three types of pure annuities.

- The first one, i.e. immediate annuity ceases on death of the annuitant and hence would not be preferred.
- The second one, i.e. Immediate annuity with 3% simple annual increase would also cease on death of the annuitant taking place any time and would not be preferred.
- The third option, i.e. joint life and last survivor annuity (50% to the surviving spouse) would continue till the survivor is alive and thus ensure protection of the life style; this pension would be the mostly preferred choice. But this pension does not offer any protection from inflation. Even at 7% pa accumulation, the annuitant would get every year Rs1,77,172 starting from age 62 years. After deducting Rs 10,000 towards mediclaim premium, the annuitant would get Rs 1,67,172 pa payable in monthly instalments of Rs.13,931. On his/her death, if earlier, the spouse would get 50 % of the annuity.
- The fourth option is a combination of annuity and insurance and fetches a relatively lower amount of annuity and leaves the cash for the benefit of the heirs. This option is very popular in India, but provides a low annuity and is mentioned here for comparison purpose only.

15. Factors affecting the quantum of Pension

a) At 5% annual average inflation, the equivalent monthly joint life and last survivor annuity value available at age 62 years of Rs13,931 would reduce, after allowing for medi claim premium, in subsequent years at Rs.13,234, Rs, 12,573, Rs11,944, Rs 11,347, Rs 10,780 …….etc, thus further bringing down the standard of life .

b) In all these calculations, the impact of Income tax is not taken into account, assuming that the Government would encourage retirement savings by offering Income Tax relief. If such a relief is not made available, the annuities shown in the above calculations would reduce by 20 % to30 % in 30 years time.

c) In these calculations, the present LIC `s tabular Annuity rates are used. The annuity rates would reduce significantly over the next 30 years, on account of improvement in longevity. This would cause reduction in annuity amount that can be purchased. The reduction could be about 20-25 %.

d) If the reduction in the estimated pension on account of impact of Income Tax and increase in longevity together are taken into account, the above mentioned estimates may drop by even 50 % and the monthly joint life and last survivor pension would be Rs 6,966 at age 62 and reduce to Rs.6,618, Rs 6,287, Rs5,972, Rs.5, 674 ,Rs.5,390….etc in subsequent years after allowing for 5 % pa inflation..

e) Various innovations are improving the life style. Thirty years earlier, the remote places of rural India were not having electricity ; TV, fridge and even bottled gas had not reached many urban households. Today frost-free refrigerator, music system, colour TV, computer at residence etc are fast becoming a necessity. The mobile phone has replaced landline phone and will soon be replaced by new generation mobile phones. Two wheelers or four wheelers have become means of transport for the families. Air transport is becoming a way of travelling long distances for families. These will be in keeping with the salary income then prevailing. The change in life style will warrant more monthly income.

f) In next five, ten and fifteen years, the annual salary would have grown from Rs 5,18,633 to Rs.6,61,922, Rs.8,44,799 and Rs.10,78,201 respectively in keeping pace with inflation Only the then earning persons can afford the then prevailing life style. The retired persons would not afford the then prevailing life style and in fact would find it difficult to make both ends meet as inflation would have eroded their income.

g) In the above narrations, it is presumed that adequate standard of life can be maintained with replacement income equal to 50% of retirement salary. It is brought out in earlier para of the Paper that the replacement ratio is estimated at 70% of the retirement salary in Canada and 75% to 80% in USA. It is estimated by financial projection experts that in another 20-25 years` time, India would reach the status of a developed nation, in which case the replacement ratio would tend to increase from present 50% to 70% available in Canada or in any case,

at least to 60 %.The results of the presentation made so far will then look more inadequate and living standard of retired persons will look still more inadequate.

16. Does the four ways to make for a shortfall is really helping?

Looks like a moderate "save more and retire late" and safe investment plan for a salaried person is not helping at all. Does it mean we should take refuge to "Invest aggressively"? **But, it says, of course, the more aggressively one invests, greater is the potential risk.**

So, how much is enough? The magical figure still remains unreachable. For Mike Michelozzi and billion other retirees all over the world "…. ***a pension is not enough. We couldn't live on ours…" And for those for whom there is no pension provision, it will be a nightmare indeed.***

17.Conclusion

If an individual can save 10 % of his income for 30-32 years and can invest it prudently to earn a compound growth rate of 6-7 % annually , the corpus will not be sufficient to sustain him and his spouse for the next thirty years of their retired lives, as the corpus would not generate an income level of four to five times of his savings rate. The Corpus required at age 60 years would be at least four times the accumulations at age 60 ; such accumulations will be Rs17,36,802 (75 % of the accumulations) at age 60 years if investments have earned 7% pa(.Pl. refer to Para 12)Thus the required corpus would be Rs.69,47,208/- Alternately ,the value of a joint life and last survivor annuity (wherein the full annuity instalment is payable to the annuitant and 50% of the annuity instalment is payable to the surviving spouse on the death of the annuitant) on the basis of 5% annual interest earning and 5% annual inflation may be estimated so that the annuitant can maintain his/her life style. On assumption that the replacement income net of mediclaim premium is Rs2,49,317/- (Pl. refer to Para 12) , the required corpus would be Rs 67 lacs to Rs.70 lacs.

Such amounts are beyond the reach of an average employed person.

In view of the foregoing , most of the individuals will have to extend their working years ,if possible, or generate additional income through other means or learn to give up their life style and live a much simpler retired life philosophically. That would seem to be the only possible way presently for individuals who are outside Pillars 1 and 2.

!8.Thanks

I could write this Paper with the facilities available, when I was with Metlife India Insurance Company Pvt Ltd , Bangalore. I sincerely thank them. Mausumi Datta Sahu of Actuarial Wing helped me significantly .I also sincerely thank her and other actuarial colleagues.

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