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GRT INCREASING AGING POPULATION-A GLOBAL PHENOMENON-A REMEDY TO MEET THE FINANCIAL GAP CAUSED

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Abstract:-The rapidly changing life style throughout the world, the technological advancements, blending of cultures and expeditious mobility of factors of production including capital and labour force, increase in wants and needs of people and the galloping initiatives in the front of innovations and creativity have incredibly contributed to the growth of trade and commerce across the globe. They have tremendously added to balanced development and stabilization to great extent of the economy of many countries in the world. Consequently the industrious and busy life thrust upon those in active life has caused demographic changes in the society. Family sizes have been reducing. This may be considered a positive sign to reduce the population growth on one hand. Longevity has increased and hence on the other hand the dependency ratio has gone up. Though the income comes to an end at certain stage in life yet the consumption will continue. As the birth rate decreases and the aging population increases the gap between the potential for production of income and its utility for consumption will widen. The burden for providing for the increasing aging population falls on the society. It could be an additional tax on the working population. This is posing a great challenge to the world community and is bound to expand year after year. A pension system appropriately planned, monitored and implemented will be close to an ideal means to combat this threat.

At the same time to put in place a successfully workable competent pension system is not that easy as it appears. There are many issues involved in administering the scheme, investment of the fund to comply with the promised liability of the required quantum of life pension, the envisaged increasing number of pensioners, fluctuations in earnings on the fund, cost involved, increasing longevity and consequent higher dependency ratio are a few to quote.

An attempt has been made to comprehend the complexity of a good pension protection to the aging dependent population.

Keywords: Uninterrupted supply of money-joint family-nuclear family-longevity risk-sponsoring agency-senior citizen-personal pension-occupational pension-social security scheme-money purchase and benefit purchase-immediate and deferred annuities-variations in interest rates- risks-pension expectations-pension wealth accumulation-the three pillars-age dependency ratio- world bank data-pension system characteristics-pension fund- fund managers- actuary.

INTRODUCTION

A person's earning period would come to an end sooner or later during his life time. For some it could happen in ripe old age and for others it might happen much earlier. In case of employees it terminates with retirement or earlier in the event of unfortunate death or total disablement while in employment.

While the regular income generated through employment or in active business ends the continuation of necessities of life such as food, shelter and clothing persists till the last day of life. However ingenious one may be in

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saving for the old age, yet the amount so accumulated can be fretted away or used for some other exigencies that may intervene unexpectedly. Besides the obligations towards start in life and marriage of dependents which are essential to be attended to cost sizable expense leading to shrinkage of the savings. Other unavoidable ceremonies compelled by customs and practices further deplete the fund.

Investment of the amount saved to put money at work is another task and particularly at old age with senility set in, not all including those who were once fairly good in investment can manage their portfolio. A periodic uninterrupted supply of money for one's life time can eliminate to a great extent the financial crisis of old age. With the Joint family system that offered built in old age provision breaking down and nuclear family structure being the order of the day, living too long after the active financially productive stage is a potential risk contingent on human life. **Thus the necessity of embarking on the system of pension plans.**

Benefit to individuals as also to the economy

Individuals get financially provided for peaceful and tension free retired life, substantial relief to the society which would have to otherwise bear the burden associated with aging population and above all a robust pension system efficiently monitored and administered helps in growth and stability of the economy, making available long term financial support to new and promising projects.

RATIONALE FOR PENSION PLANS:

Individuals may be Myopic and may not save for the retirement years. With insufficient savings they become a draw on society.
Even when individuals do save, they are faced with the following types of risk.
1)Longevity risk
2)Uncertainty regarding inflation, which can deplete private savings.
3)Uncertain rates of return on investment of savings.
4) Solvency risk of the sponsoring Agency

THE TWO MAJOR ISSUES:

1. LONGEVITY AND INCOME REPLACEMENT

The appropriate income / wage replacement ratio to be targeted should be that to maintain the retirees' pre-retirement standard of living during the retirement years. In other wards the retirees should not have to experience a sudden drop in their standard of living.

In arriving at such an amount as pension, net changes in age sensitive factors have also to be included because consumption patterns differ between pre and post –retired periods.

Eg. Housing and educational expenses reduce, need for personal savings reduce, but health expenditures will increase.

It will be extremely useful if experts are able to arrive at reliable figures as to what these levels should be for various segments of the Indian population. They have to take into account the effect of inflation.

Rs.1/- of income at the time of retirement assuming a rate of inflation of 3% per annum is worth 86 paise after 5 years and only 74 paise after 10 years. Adequate consideration should be given to indexing of retirement benefits.

2. Financial (Issue)

a.Suitable Financial instruments have to be available for the implementation of a robust pension structure and the government has a role to play in making available such long-term instruments of investment.
b.The pension providers usually an Insurer should have a team of efficient fund managers to manage the huge fund at their disposal.Again, the investment strategies adopted by the pension funds should focus on the aspect of Asset-Liability match for suitable delivery of pensions

Any civilized society should be able to take care of two important segments of its members.

The first is children during their dependent period which could range anywhere between 20 yrs. to 25 yrs.-till they become majors or are settled in life by becoming economically productive.

The second is senior citizens who have crossed their productive period either fully or partially.This group too requires sustenance and support almost for the same duration say 20 to 25 years and the amount incurred on this group has no possibility of getting any return. It does not add to productivity, but only creates demand for consumption of goods and services

Pensions can broadly be classified into:
1. Personal Pension
2. Occupational Pension
3. Social Security Pension

1. Personal Pension: Under personal pension, the consideration amount of corpus is built up by the individual himself, through an insurance policy.

2. Occupational Pension: Under the occupational pension, the employer either wholly or partially contributes to provide pension to his employees. These schemes are of two types.
◄ Money purchase
◄ Benefit Purchase

Under the Money purchase schemes, also known as defined contribution scheme, the contribution is made at a defined level and the benefit depends upon the accumulated value of such contribution.

In case of benefit purchase scheme, the benefits generally depend upon the service and salary of the employees and can be expressed as a formula such as 1/66th of final salary for each year of service etc.

3. Social Security Pension: This pension is normally sponsored by the state and certain classes of senior citizens are covered there under. In India, the state pension as a social security measure is almost absent.

Whether through personal pension or occupational pension, what an individual plans to achieve is a regular flow of income after the active working life, through which he will be able to maintain a standard of living, at least equal to the one enjoyed by the person during his active working life.

The quantifiable figure

The process of arriving at a quantifiable figure – retirement /pension plan-involves answers to two key questions:
1. How long might a person live after retirement?
2. How can one prevent the outliving of his financial resources?

The answer to the first question is life expectancy i.e. the number of years a person is expected to live, applicable to a group of persons he belongs to.

The answer to question two involves consideration of following factors.
1. Income needed to attain the desired standard of living- Replacement Ratio.
2. The amounts likely to flow at the time of retirement either through the employer or through personal savings.
3. Support necessarily to be provided to any dependents
4. Mortgage loans for housing, vehicles to be repaid.
5. Further life style such as travel, hobbies etc.
6. Effect of inflation on the cost of living.

Both these questions need to be carefully considered and appropriate pension plan drawn up. Life Insurance provides security to the family in case of death of the breadwinner and pension provides security to the breadwinner if he lives beyond the working life.

Hence every individual has first to provide for the Life Insurance needs and after fulfilling a part of the target, he should think in terms of starting a plan for old age provision viz pension for life.

UNDERSTANDING THE PERSONAL PENSION PLAN:
There are two types of annuities:
◄ Immediate
◄ Deferred

Under immediate annuities, the premium-purchase price – is payable in one lump sum known as single premium. In consideration of the single premium, the insurer agrees to pay at agreed intervals, a pre- determined amount for an agreed period or throughout the lifetime of the policyholder, known as annuitant. This provides a fairly good rate of return with 100% security. Probably the condition imposed by any provider is that the pensioner will have no right to foreclose the contract.

Under the deferred annuities, the monthly installments of pension / annuity will commence not immediately but after a pre-determined number of years known as deferment period. Thus there will be two periods in the deferred annuity plan - one is the accumulation period and the other annuity payment period. The premium or purchase price too will generally be received by the provider not in one lump sum, but yearly, half yearly, quarterly or monthly, though it can also be paid in one lump sum.

IMPACT OF VARIATION IN INTEREST RATE:

Whenever an insurer anticipates that the investible / invested funds may not yield as high an interest as they were earning earlier, he responds with a downward revision in the annuity rates and a simultaneous upward revision in the premium rate. While the reason for downward revision in the annuity rates is easily understood and accepted, most people question the necessity for a simultaneous upward revision in the premium rates.

The reason is not too difficult to detect. Lower yields over investments will not only have an impact on the annuity paying period, but over the premium paying period as well. That is to accumulate a given cash option during a chosen premium paying period (deferment –period), a higher quantum of premium is required than earlier. That is why under deferred annuity plans not only is there a reduction in the annuity rates but there is also an upward revision in the quantum of premium payable during the deferment period for a given cash option and a chosen deferment period.

There is one more important point to be understood here. The degree of uncertainty in predicting interest rates is also related to the immediacy of the time frame over which one is required to take a view.

There is a greater degree of uncertainty in taking an interest rate view over an annuity-paying period that would commence say 20 years hence, as compared to an annuity-paying period that would commence immediately. That is to say, longer the deferment period of a policy, the interest rate scenario that would prevail when it vests, will be more difficult to predict. Hence it is not uncommon for insurers to structure the annuity rates in different slabs based on the length of deferment period.

Risks

However, the subscriber is exposed to two major risks at the time of exit. If there is a major market shock at the time of retirement (say, an incident such as the attack on parliament on Dec 13, 2001) leading to a fall in asset prices, the entire accumulated wealth is at risk. A subscriber still left with a few years to exit from service would likely ride over this shock, but a subscriber retiring at that time will be affected adversely. Second, the subscriber has to purchase an annuity at the time of exit, and is similarly exposed to any sharp downturn in the annuity market at that time. There will not be any explicit or implicit assurance of benefits except market based guarantees to be purchased by the subscriber. This rule is different from the case of bank deposits, where deposits up to Rs 1 lakh are guaranteed by the Deposit Insurance and credit guarantee corporation.

Pension expectations

The estimated likely annual pension if Rs 1000 is invested per month for 35 years, assuming that the entire pension wealth will be converted to an annuity and the annuity rates at that time will be the same as currently available per lakh of purchase price of annuity, will be as given in the table below. However the actual annuity could be lower if the average life expectancy increases over the next 35 years, leading to lower annuity rates.
Estimated pension per Rs 1000 invested per month in an IPA for 35 years.

Scenario	I	I I	I I I	I V
Inflation adjusted annual return on pension corpus	1.50%	2%	3%	4%
Pension wealth (inflation adjusted)	550860	605413	735467	899915
(a) Annual pension for only self	47153	51823	62955	77032
(b) Annual pension for self and spouse, after self, to continue.	42801	47040	57145	69923

Note:

1. The return has been assumed to be net of inflation and at a constant rate throughout the period.
2. The entire pension wealth at the time of retirement (age 60 yrs.) is invested in an annuity
3. Life annuity is assumed @ Rs. 8560/= per lakh for self and Rs. 7770/= for self and spouse in which case the spouse will get 50% of the amount as annuity after death of self.
4. The assumption of flat contribution is simplistic, as the monthly investments would typically rise with wage growth.

5. The annuity is not inflation adjusted after its first year.
Source: Parliamentary research source estimate.

CASE 2

We may consider one more situation with the following assumptions
1. Salary at commencement, per month is Rs 10,000/-
2. Rate of annual contribution as a percentage of salary is 10%
3. Annual increment in salary as a percentage of immediately preceding annual salary is 5% (percentage increment @ 5% is assumed to be constant throughout the service)
4. Growth rate of the fund is assumed to be uniform @ 8% p.a.
5. Annuity /pension to commence at age 60 yrs (on retirement)
6. As before the annuity for self is assumed @ Rs 8560/= per lakh of pension wealth for self and Rs 7770/= per lakh of pension wealth for self and spouse, where the pension will reduce to 50%, payable to spouse on death of self.

The accumulation as also the pension payable with the above assumptions for various accumulation periods will be:

Term of accumulation = n yrs	Accumulated pension wealth Rs	Pension for self Rs	Pension for self and spouse Rs
10	212010	18148	16473
15	437286	37432	33977
20	803042	68740	62396
25	1384812	118540	107600
30	22,96,215	196556	178416

Calculation of accumulation value i.e., pension wealth, is shown in annexure A below:

ANNEXURE A

"Accumulation = [12RP/100] (1+i)n-1 [1-(i1)n/1-i1]"
Meaning:
R= percentage of annual salary for contribution
P= salary at commencement
i= growth rate of fund
i1= annual increment to salary as % of P.
i1= 1+i1/1+i
n= term of accumulation

Term "n" yrs	$\frac{12RP}{100}$ Rs	$(1+i)^{n-1}$	$\frac{12RP}{100}(1+i)^{n-1}$ (2x3) Rs	$i^1 = \frac{1+i_1}{1+i}$	$\frac{1-(i^1)^n}{1-i^1}$	Accumulation $=\frac{12RP}{100}(1+i)^{n-1}$ $\left[\frac{1-(i^1)^n}{1-i^1}\right]$
1	2	3	4	5	6	Rs (4x6) → 7
10	12000	1.99900	23988	0.97222	8.83815	212010
15	12000	2.93719	35246	0.97222	12.40668	437286
20	12000	4.31570	51788	0.97222	15.50633	803042
25	12000	6.34118	76094	0.97222	18.19870	1384812
30	12000	9.31727	111807	0.97222	20.53731	22,96,215

CASE 3

Yet another situation with the following assumptions:
1.   Monthly salary at commencement Rs 10,000.
2.   Percentage of monthly salary for contribution to pension fund = 10%
3.   Amount of annual increment, assumed to be uniform throughout the service Rs 350.
4.   The accumulation rate, also assumed to remain the same .08 per annum per unit of investment.

The accumulation for different terms and the pension for self alone or self and spouse will be as given below.

Term n yrs	Accumulation i.e. pension wealth Rs	Pension per annum for self Rs	Pension per annum for self and spouse Rs
10	197394	16897	15338
15	389624	33351	30274
20	684394	58584	53177
25	1129827	96713	87788
30	1796635	153792	139599

Here again assumption in respect of rate of annuity per annum per Rs 1 lakh of pension wealth, all being invested is Rs 8560/- for self alone and is Rs 7770/- for self and spouse. In the latter case pension will be 50% to the spouse on death of self.

Thus the pension wealth and pension quantum will depend up on the contribution rate, the term, yield on investment and the prevailing annuity rates on the date of vesting.
Accumulation of contribution is shown in annexure B given below:.
                                        Annexure B
"Accumulation = 12P   MSn¬ + 12P   Q (1+i)n-1 [Ian-1¬]"
              100   100
Where   P=10%
                Q=Rs.350 (constant)
                n=Term
                M=Monthly Salary at Inception / Commencement
                i= yield
Ian-1   = Present value of increasing annuity, beginning with Re 1.
Per annum and increasing @ 1 per annum

n	i	12P/100	M	Q	n-1 (1+i)	S n+	I a n-1+	12PM S n+/100	12PQ(1+i) X I a n-1+/100 n-1	Accumulation ie pension wealth rounded off to nearest Re.1.
1	2	3	4	5	6	7	8	3x4x7->9	3x5x6x8->10	9+10. Rs.
10	.08	1.2	10000	350	1.99900	14.4866	28.0550	173839.20	23554.41	197394
15	.08	1.2	10000	350	2.93719	27.1521	51.7165	325825.20	63798.49	389624
20	.08	1.2	10000	350	4.31570	45.7620	74.6170	549144.00	135250.32	684394
25	.08	1.2	10000	350	6.34118	73.1059	94.8284	877270.80	252556.06	1129827
30	.08	1.2	10000	350	9.31727	113.2832	111.7323	1359398.40	437236.80	1796635

Meaning:

S n¬ = Accumulation of annuity payable in arrear of Rs.1 per annum for n years
an¬   = Present Value of Annuity payable in arrear of Rs.1 per annum for n years.
Ian¬ = Present Value of increasing annuity payable in arrear for n years, the first instalment being unity and increasing by one each year

$(1+i)n$ = Compound interest formula.

THE THREE PILLARS:

Pension Systems are generally divided into three pillars and the choice Individual has is from among these or from a mixture of these.

First Pillar: Social security for the poor. Normally, here, the obligation is not funded. Due to economic constraints this has limited availability in India.

Second Pillar: Pension to the gainfully employed through a provident fund, where under equal contribution is made by the employer.

Third Pillar: Pension secured through voluntary contributions, also available as additional protection

For the purpose of providing the benefits of pensions the population can be divided into Five large segments.
1. Employees in the Government sector
2. Employees in the Public Sector
3. Employees in the Organized Private Sector
4. Professionals in the Unorganized Sector
5. Workers and labourers in the informal Sector.

Age Dependency Ratio

The age dependency ratio-the share of the retired population to those in the working age group-is as yet low in India and China, but it is expected to increase faster than in the developed economies. It took over a hundred years for this ratio to double in the developed countries, where as in India it will take about 40 years, and in China and Thailand about 30 years.

The following table shows how this ratio is expected to increase over the next three decades.

A crude way of defining dependency ratio(DR) will be

$$DR = \frac{\text{Population of age 60 and above}}{\text{Population between ages 20 to 59 yrs}} \times 100$$

THE DEPENDENCY RATIO'S OF COUNTRIES BETWEEN 1995 TO 2035 (PROJECTIONS)

Country	YEARS				
	1995	2005	2015	2025	2035
Australia	27.8	30.3	40.0	52.6	62.5
USA	29.4	30.3	40.0	55.6	58.8
Japan	35.7	47.6	66.7	71.4	83.3
U.K.	38.5	40.0	47.6	71.4	83.3
Germany	35.7	43.5	47.6	58.5	66.7
India	14.9	15.6	16.9	21.3	27
Thailand	14.1	14.9	18.9	28.6	41.7
China	17.2	18.5	24.4	33.9	47.6

Source: World Bank Data

There were 76 million Indians over age 60 in 2000. This figure is projected to increase to 218 million in the year 2030. The share of population over 60 to the population of working age is expected to increase from 15 in the mid-nineties to 40 in 2030.

LIFE EXPECTANCY AT 60 YRS FOR MALES

Group	Year		
	1998	2010	2030
World	15.9%	16.7%	18.1%
Low & middle income countries	15.2%	16.1%	17.4%
High Income countries	19.6%	20.2%	21.5%

Sources: World Bank Data

Reverting back to the concept of dependency ratio, a more sophisticated and meaningful way of looking at it would lead to its definition as: " A measure of population which is composed of dependents – i.e. people who are too young or too old to work. The dependency ratio (DR) is equal to the number of individuals aged below 15 or above 64 divided by the number of individuals aged between 15 and 64 years, expressed as a percentage.

In Economics, the dependency ratio is the ratio of the economically dependent part of the population, to the productive part. The economically dependent part is recognized to be children who are too young to work, and individuals who are too old, that is generally, individuals under the age of 15 and those over the age of 64. The productive part makes up the gap between i.e. ages 15 to 64 years.

$$\text{Dependency ratio} = \frac{(\% \text{ under } 15) + (\% \text{ over } 64) \times 100}{(\% \text{ between } 15 \text{ to } 64)}$$

This ratio is important because as it increases, there is increased strain on the productive part of the population to support the upbringing and pensions of the economically dependent.

Pension System Characteristics

Pension systems are typically labeled as
1. Pay-as-you-go (PAYG) also known as unfunded system.
2. Fully funded
3. Partially funded

In the PAYG system, contributions are neither fixed nor uniform. Initially when pensioners are few and the worker young, the cost of the plan is low. As the pension system matures and the population ages it becomes necessary to raise contribution.

In the fully funded system, the accumulated pension reserves equate to the present value of all pension liabilities owed to current members. The reserves are invested in a fund of specially held identifiable and available assets.

Partially funded pension systems share features of both PAYG system and fully funded individual accounts.

PENSION FUND INVESTMENTS

Without debating the finer points of pension plan law, we can say that pension plans exist to provide post-retirement income to employees. A pension plan is really a number of promises to pay people income after retirement. In a traditional defined benefit' pension plan, the pensions are defined according to a formula specified in the plan documents. This usually takes the form of a percentage of the 'best years' of salary.

At any point in time, an actuary can calculate how much money must be set aside to cover the future cost of pensions, given an investment return until eventual retirement. Actuaries also calculate how much a company must contribute to its pension plan to cover its obligations, in case of the employer providing for pension after retirement to his employees.

A plan's Financial Condition Matters

From what has been discussed above it is clear that for ensuring the aging population of a blissful retired life after having contributed their might to the society during their active productive life, it is imperative to concentrate

individually and collectively on the following action plans:

1. Educating the masses of the necessityof retirement planning at the very beginning of starting the economic activities, be it taking up employment, business or other commercial activities.

2. Decide on individual pension plan by entering into contract with the pension providers.

3. Employers to take responsibility where ever possible of devising schemes with the providers / insurers a super annual scheme for theiremployees providing pension after retirement.

4. Able and efficient services of fund managers/ financial planners/ investment expert and actuaries to be identified and utilized for management of the huge fund that can be pooled to meet this dire necessity of the society.

5. Involvement of the government to ensure development of better investment avenues and utility of the pooled fund in the capital marketmeticulously monitored taking into account the risk and return parameters.

As responsible citizens enjoying many benefits and comforts that have emanated as a result of toiling and soiling of hands of the now retired, shall we not give back to the society the strength to take care of our senior? This can be achieved through our robust pension schemes.

A NOBLE THOUGHT TO BE SERIOUSLY CONSIDERED TO GUARANTEE THE WELL BEING OF ALL CREATING A SOCIETY WELL BALANCED TO PROTECT ITS MEMBERS, YOUNG OR OLD.

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