

Acturial Valuation

- Actuary - Expert in Statistics, esp. calculating insurance risks and Premia
- Valuation - Estimation of thing's worth esp. by professional valuer
- Fund
 - Receipts of contributions/ Premia
 - Outgoings by way of Benefits/ annuity

What do actuaries do ?

- Assess Financial impact of tomorrows uncertain events.
- Support better informed financial decisions with more confidence.
- Report based on:
 - Analyzing the past.
 - Modeling the future.
 - Assessing the risk involved
- Communicate the results in financial terms.

Role of Actuary

- Quantification of contingent risk and to advise to manage the risk.
- Design and management of pension schemes.
- Investment advise and Active Fund Management.

Need for Valuation

- Statutory requirement
- Ensuring the solvency and adequacy of the Fund.
- Revision in rate of inflow of contribution/ outflow of benefit.

Statutory Provisions

<u>Scheme</u>	<u>EPF1952</u>	<u>EFP 1971</u>	<u>EPS 1995</u>	<u>EDLI1976</u>
Para	No Provision	34D	32	No Provision

- Annual Valuation or otherwise.
- Based on valuer's report to revise
 - a). The rate of contribution.
 - b). The scale of any benefit.
 - c). The period for payment of benefit.

Valuation of Liabilities

- Liabilities of existing pensioners of EFP 1971 & EPS, 1995 on the Fund
- Past service liabilities of existing members.
- Guarantee of pensionary benefits – in the absence of compliance.
- Projection by modelling.
- Life expectancy & mortality .

Valuation of Assets



- 1 – Receipt of contributions at statutory rate.
- 2 – non receipt of contributions due to
 - a) Exemption application being in process.
 - b) Employers' default.
- 3 – Pattern of investment and investment opportunities.
- 4 – Yield on investments.
- 5 – Efficiency in handling the Fund.

Pension Fund Liabilities

- ❑ Pension Fund liabilities means benefits to the members.
- ❑ Estimated series of cash flow of benefits payable in future.
- ❑ Presented in the form of aggregate forecast of all the benefits to the members.
- ❑ Estimated cash flow based on liabilities of existing members and ignores future joiners.

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- ❑ Liabilities are long dated.
- ❑ Present value of distant Payments.
- ❑ Estimated cash flow rise steadily from current levels and falls more sharply in later years.

Factors impact the value of liabilities



- 1). Estimated future annual cash flows of promised pension payments.
- 2). Estimated present value of future pension payments.

Rise in Future Payments - Factors

- Increased longevity.
- Declaration of relief.
- Service.
- Inflation.

Present Value of Future Payments

- ❑ Sensitive to changes in discount (interest) rates.
- ❑ Lower the discount (interest) rate higher the present value and vice versa

UNCERTAINTY IN FUTURE BENEFITS



- ❑ Early retirements.
- ❑ Improvements in mortality.

Resulting in estimation errors.

Effects of change in market interest rate



- ❑ Significant volatility of the cost of providing future benefits.
- ❑ Volatility of liabilities is often higher than diversified portfolio of assets.
- ❑ Longer the term of estimation higher the volatility in liabilities.

India - Life expectancy at birth

Year	Life Expectancy at birth	Rank
2003	63.62	161
2004	64.35	162
2005	64.35	162
2006	64.71	162
2007	68.59	144
2008	69.25	144
2009	69.89	144

Definition: This entry contains the average number of years to be lived by a group of people born in the same year, if mortality at each age remains constant in the future.

Life expectancy at birth: total population : 69.89 years

Male: 67.46 years

Female: 72.61 years

MORTALITY RATE (PER MILLION)

Age	Assured Lives Mortality (Table LIC 94 – 96)	Annuitants Mortality LIC – 96 98 (Experience)
20	999	919
30	1170	1166
40	2053	1721
50	5244	4248
57	10294	8710
70	-	24301
80	-	70802
90	-	151539
100	-	266511
110	-	415720

8th Valuation of Pension Fund as on 31.03.2004

(Rs. In crores)

Assets		Liabilities	
Fund Balance	52745	Member Pension	99262
		Death Benefit	15010
Future contri @ 9.49%	101522	W/ Benefit	48754
		Existing Pension Payment	12269
Deficit	22021	Expenses	662
		Reserve	331
	176288		176288

Status of Surplus/ defecit on valuations of Pension Fund

Valuation	Period of Valuation	Surplus/ Deficit (Rs.in Crores)
1 st	16.11.95 to 15.11.96	(+)1689
2 nd	16.11.96 to 31.03.98	(+)1239
3 rd	01.04.98 to 31.03.99	(+)732
4 th	01.04.99 to 31.03.00	(+)70
5 th	01.04.00 to 31.03.01	(-)43
6 th	01.04.01 to 31.03.02	(-)17136
7 th	01.04.02 to 31.03.03	(-)19291
8 th	01.04.03 to 31.03.04	(-)22021

ACTUARIAL VALUATION – DATA FORMATS

Sl.	Field	Active Members'	Exit Members'	Pensioners' data
1.	Employee Identity/ Name	Y	Y	Y
2.	Establishment Code	Y	Y	Y
3.	Date of Birth (MM-YYYY)	Y	Y	Y
4.	Gender	Y	Y	Y
5.	Marital status	Y	Y	N
6.	Date of Joining (MM-YYYY)	Y	Y	N
7.	Wages as on 15.11.1995	Y	Y	N
8.	Wages as on Valuation date	Y	N	N
9.	Max. Salary limit for contribution	Y	N	N

ACTUARIAL VALUATION – DATA FORMATS

Sl.	Field	Active Members'	Exit Members'	Pensioners' data
10.	Date of Birth of spouse living	Y	Y	Y
11.	Gender of spouse	Y	Y	Y
12.	Date of Birth of first child living	Y	Y	Y
13.	Date of Birth of second child living	Y	Y	Y
14.	Date of Exit	N	Y	N
15.	Certificate Issued	N	Y	N
16.	Wage on exit date	N	Y	N
17.	Amount of Basic Pension	N	N	Y
18.	Amount of increase in Pension	N	N	Y
19.	ROC Option	N	N	Y
20.	Original Pension at Retirement	N	N	Y
21.	Current Pension Amount	N	N	Y

ACTUARIAL VALUATION – DATA FORMATS

Sl.	Field	Beneficiary Pensioners Data	Remarks
1.	Identity	Y	
2.	Establishment code	Y	
3.	Date of birth of the spouse beneficiary	Y	
4.	Date of birth of first living child	Y	
5.	Date of birth of second living child	Y	
6.	Current recipient/s of pension	Y	A= All C= Children D= Second child
7.	Current pension amount paid	Y	
8.	Current pension increments being paid	Y	

Pension Fund – EPS'95 at a Glance

		(Rs. In crores)
1.	Annual contribution in 2008-09	10487.78
2.	Corpus as on 31.03.2009	108578.28
3.	Monthly Pension paid in 2008-09	3120.84
4.	Withdrawal benefit paid in 2008-09	1669.94
		(In Numbers)
5.	Membership as on 31.03.2009	44547765
6.	Pension beneficiaries as on 31.03.2009	3246131
7.	Withdrawal benefit/ Scheme Certificate (Form 10-C) claims settled in 2008-09	2659214
8.	Monthly Pension (F-10D) claims settled in 2008-09	410376

THANK YOU