

# 15<sup>th</sup> Seminar on Current Issues in Retirement Benefits

Hotel Sea Princess, Juhu, Mumbai  
29<sup>th</sup> November, 2018

## Attrition Rate Analysis and It's Impact on Actuarial Valuation

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# Agenda

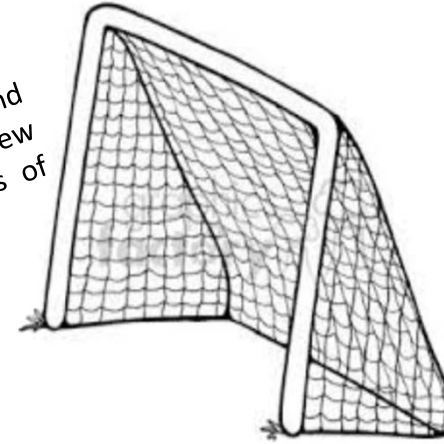


- Introduction
- Data Collation, Storage and Analysis
- Attrition rate based on service
- Attrition rate based on Age
- Industry wise Attrition rate analysis
- Impact of Attrition rate on non-vested benefits
- Impact of Attrition rate on vested benefits
- Conclusion

# Reason for Attrition Rate Analysis

Assumptions are an integral part of performing actuarial valuations. Setting up actuarial assumptions involves reasonableness and acceptability is of prime importance.

The Actuary's responsibility does not end with assisting company management and auditors in setting up of assumptions but also revolves around performing regular review of the appropriateness of the said assumptions by conducting a detailed analysis of Actuarial Gains and Losses.

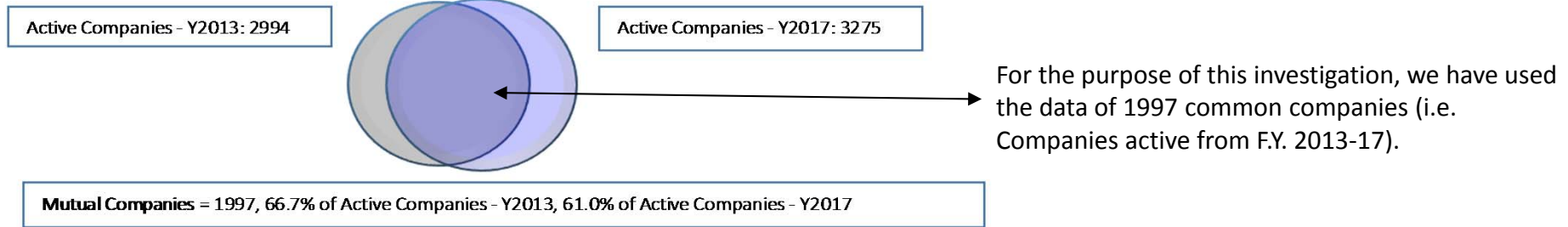


This presentation is based on a large body of company statistics and specific investigations have been deployed to derive such standard attrition rates.

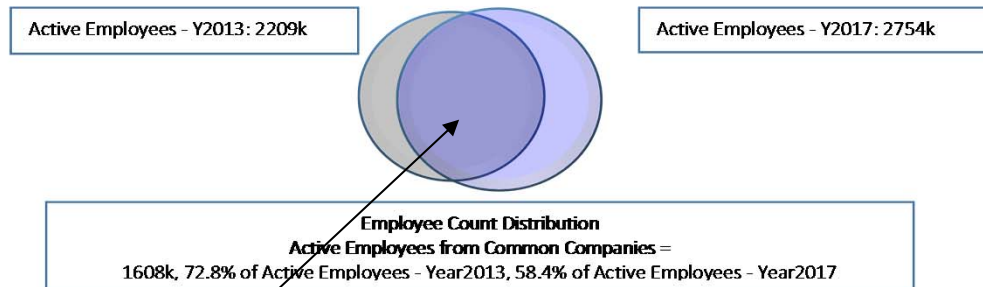
# Data Collation



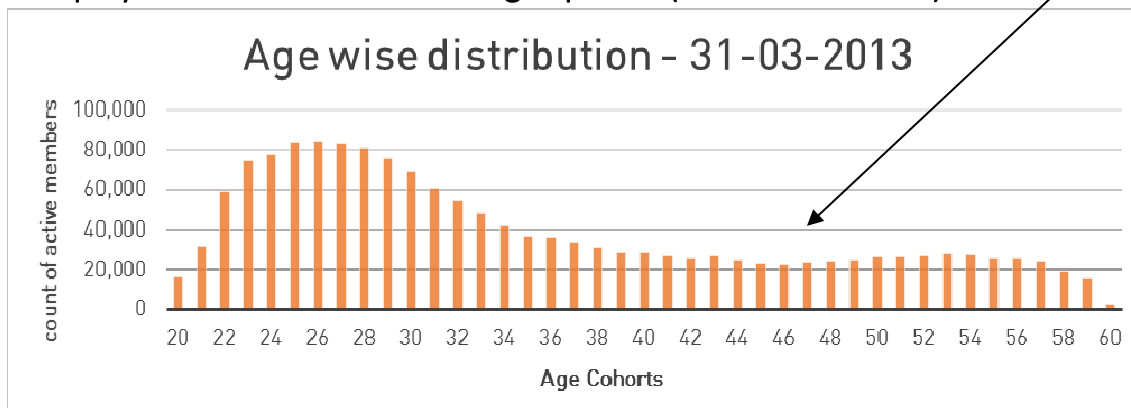
For trend analysis of attrition rate, employee data investigation was performed over the last 4 years. The data was gathered from March 2013 to March 2017. The companies active as on 31-03-2013 were 2994 which subsequently increased to 3275 companies in 31-03-2017.



As at 31-03-2013, active employee data available for gratuity valuation was approximately 2.2 million for 2994 companies. Out of 2994 there were 1997 companies which stayed over end-to-end valuation period with employee count of 1.6 million.



Employee Count Distribution – Age Specific (As at 31-03-2013)



At each valuation date, age and service of individual employee is calculated to lower absolute value integer. In respect of employees who were active for companies which are selected for analysis as at 31-03-2013, we summarized 1.6 million employee data as follows:

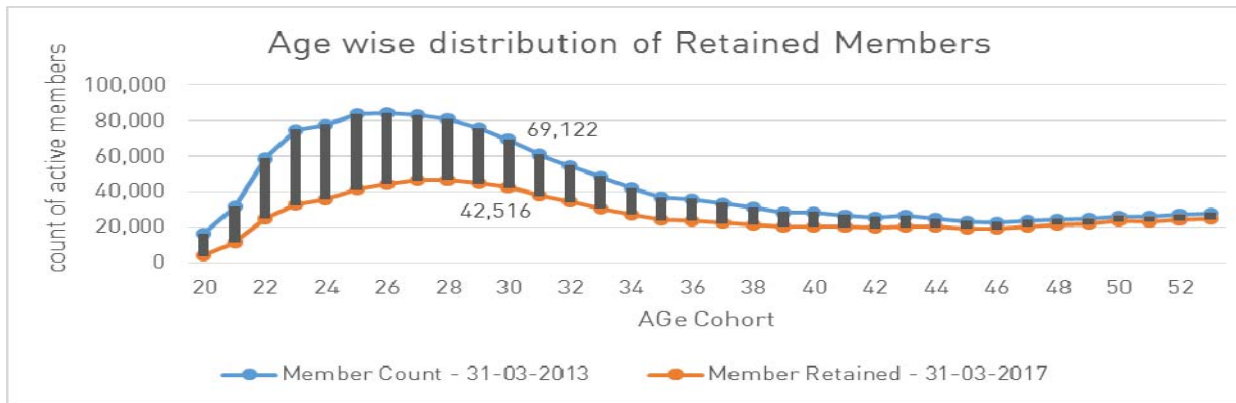
- Age
- Service
- Company Size
- Industry Type

# Results – Age and Service Specific



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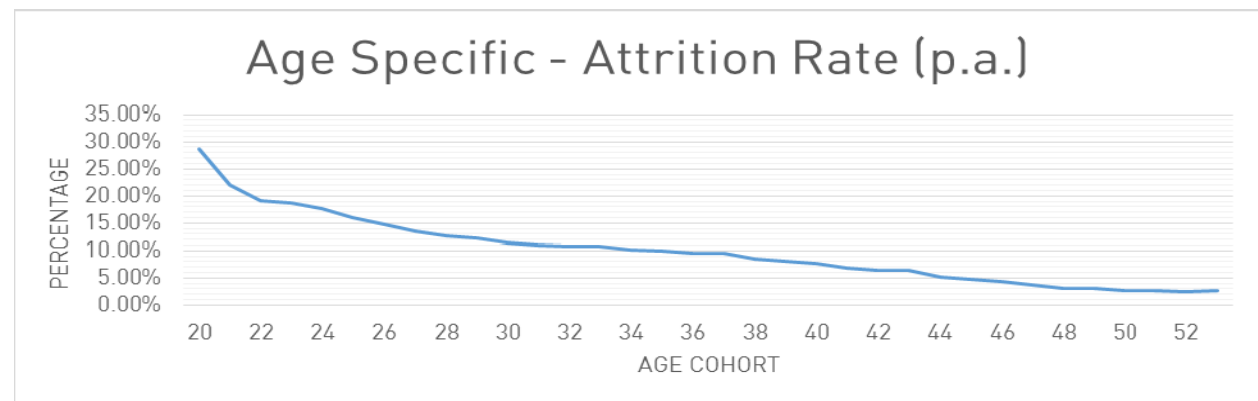
## Employee Count Distribution for retained employees – Age Specific



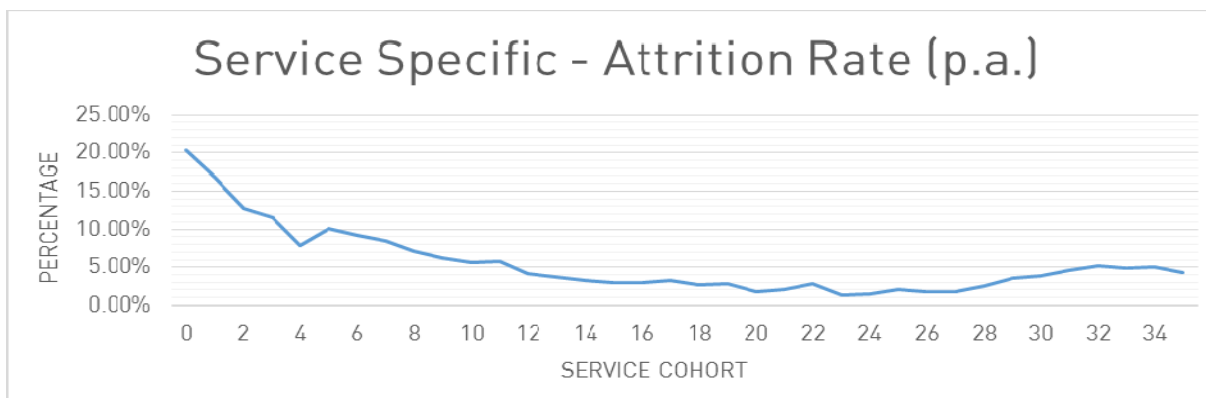
Collated information of employees which were active as at 31-03-2013 were compared with active employees as at 31-03-2017. This was done by making an Age - Service matrix, which is based on survival status and time-to-time information available for exits.

## Attrition Rate – Age Specific

We can observe a trend that the younger employees are now working for the same company for a shorter duration than in the past. Attrition assumption tends to be higher at the younger ages and falls as the employee gets older. The graph reflects a small up-turn at the older ages as some employees opt for early retirement.



## Attrition Rate – Service Specific



The graph reflects higher attrition for employees with lower service and conversely the attrition decreases as the service of an employee increases. Appreciation at work, job security, opportunity for advancement are few of the main reason why a lower attrition rate is reflected at the higher service range. However, a steady increase in attrition is reflected after 28 years of service as an employee tends to leave the organizations on account of retirement.

[www.actuariesindia.org](http://www.actuariesindia.org)

# Results - Industry Specific



Industry	Attrition Rate (p.a.)
Outplacement Services / BPO / KPO	34.24%
Safety & Security, Investigative Services & Products	33.95%
Online Services	22.84%
Telecommunications	22.45%
Property Development / Real Estate Services	22.26%
Insurance	21.00%
Hospitality	20.82%
Apparel / Accessories / Textiles	20.38%
Environmental Products & Services	19.84%
Infrastructure	19.10%
Manufacturing - Electronics	18.50%
Advertising, Marketing & Public Relations	17.57%
Export / Import	17.48%
Scientific & Medical Instruments	17.27%
Business Advisory, Solutions & Consultancy Services	17.21%
Gems & Jewellerys	17.21%
Biotechnology	16.78%
Retail Consumer Products	16.64%
Broadcasting / Media & Entertainment / News	16.27%
Financial Services	15.91%
Manufacturing - Other	15.58%
Travel & Tourism	15.25%
Broadband / Cable Networks & Services	15.21%
Education	15.20%
Construction & Building Systems / Materials / Fixtures	15.19%
Sourcing, Dealing, Buying & Supplying	15.15%
Electronics	14.82%
Architectural, Designing, Engineering & Technical	14.43%
Pharmaceutical / Healthcare / Skincare / Hygiene Products & Services	14.02%

Industry	Attrition Rate (p.a.)
Testing & Inspection	13.44%
Farm & Industrial Equipment	12.34%
Supply Chain Management	12.27%
Hospitals	12.20%
Packaging	12.16%
Manufacturing - Industrial	11.05%
Services – Other	10.87%
Transportation	10.34%
Hardware / Software & IT Consulting, Products & Services	10.30%
Conglomerate	10.15%
Food & Beverage Manufacturing / Distribution / Services	9.96%
Ship Management / Marine Services	8.77%
Steel	8.18%
Associations and Non-Profit Organizations	7.77%
Agriculture Products & Services	7.76%
Printing & Publishing	7.67%
Glass	7.40%
Manufacturing - Automotive	7.37%
Research Analysis & Development	7.15%
Manufacturing - Chemical Elements & Allied Products	7.04%
Sports, Athletic, Recreational, and Social Activities	6.33%
Manufacturing - Consumer	4.59%
Mining	3.58%
Government	3.52%
Energy & Resources	3.31%
Animals & Animal Products	3.27%
Airlines, Aviation Services / Supplies	2.86%
Arts / Handicrafts / Antiques / Curios	2.79%
Banking	2.65%

The highest attrition rate is observed in Outplacement Services / BPO / KPO whereas the lowest attrition rate was in Banking of 2.65% p.a.

# Results - Industry Specific ([Age Range],[Service Range])



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Sector - Steel & Manufacturing			
Range	Attrition Rate (p.a.)	Range	Attrition Rate (p.a.)
Age Range 1 - [20,30]	17.04%	Service Range 1 - [0,1]	20.04%
Age Range 2 - [31,40]	10.38%	Service Range 2 - [2,4]	12.63%
Age Range 3 - [41,50]	6.99%	Service Range 3 - [5,10]	8.94%
Age Range 4 - [51, and above]	7.97%	Service Range 4 - [11,20]	4.22%
		Service Range 5 - [21, and above]	4.37%

Sector - Pharmaceutical			
Range	Attrition Rate (p.a.)	Range	Attrition Rate (p.a.)
Age Range 1 - [20,30]	19.00%	Service Range 1 - [0,1]	21.23%
Age Range 2 - [31,40]	10.44%	Service Range 2 - [2,4]	13.92%
Age Range 3 - [41,50]	5.88%	Service Range 3 - [5,10]	7.87%
Age Range 4 - [51, and above]	5.33%	Service Range 4 - [11,20]	4.61%
		Service Range 5 - [21, and above]	3.29%

Sector - BPO/KPO/SCM			
Range	Attrition Rate (p.a.)	Range	Attrition Rate (p.a.)
Age Range 1 - [20,30]	30.49%	Service Range 1 - [0,1]	33.65%
Age Range 2 - [31,40]	18.01%	Service Range 2 - [2,4]	21.39%
Age Range 3 - [41,50]	13.03%	Service Range 3 - [5,10]	11.55%
Age Range 4 - [51, and above]	11.88%	Service Range 4 - [11,20]	6.51%
		Service Range 5 - [21, and above]	3.79%

# Results - Industry Specific ([Age Range],[Service Range])



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Sector - Hardware / Software & IT Consulting, Products & Services			
Range	Attrition Rate (p.a.)	Range	Attrition Rate (p.a.)
Age Range 1 - [20,30]	11.80%	Service Range 1 - [0,1]	11.62%
Age Range 2 - [31,40]	6.95%	Service Range 2 - [2,4]	11.18%
Age Range 3 - [41,50]	3.54%	Service Range 3 - [5,10]	7.70%
Age Range 4 - [51, and above]	2.48%	Service Range 4 - [11,20]	4.82%
		Service Range 5 - [21, and above]	2.51%

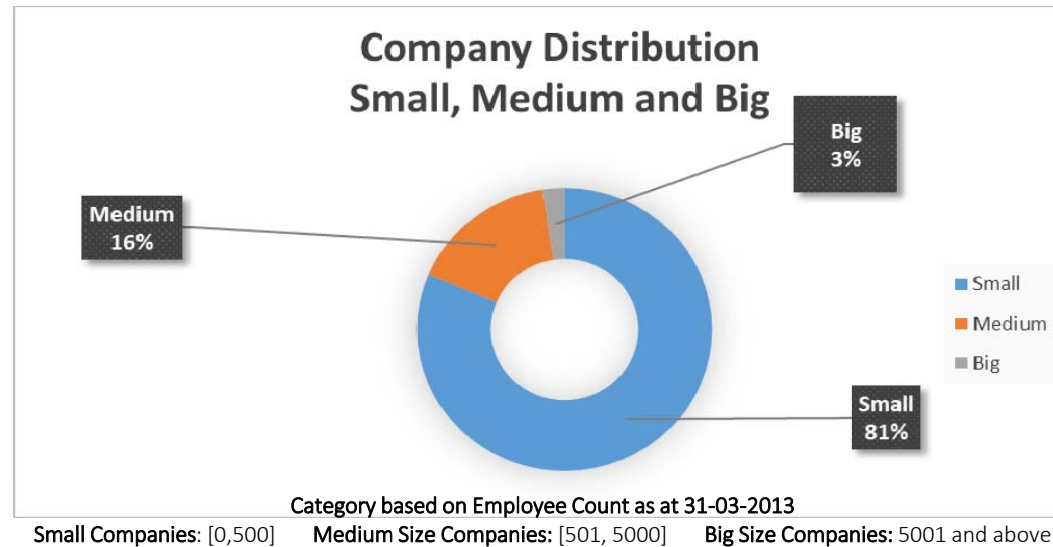
Sector - Banking			
Range	Attrition Rate (p.a.)	Range	Attrition Rate (p.a.)
Age Range 1 - [20,30]	3.08%	Service Range 1 - [0,1]	5.21%
Age Range 2 - [31,40]	1.91%	Service Range 2 - [2,4]	1.81%
Age Range 3 - [41,50]	1.23%	Service Range 3 - [5,10]	1.45%
Age Range 4 - [51, and above]	1.32%	Service Range 4 - [11,20]	1.44%
		Service Range 5 - [21, and above]	1.27%

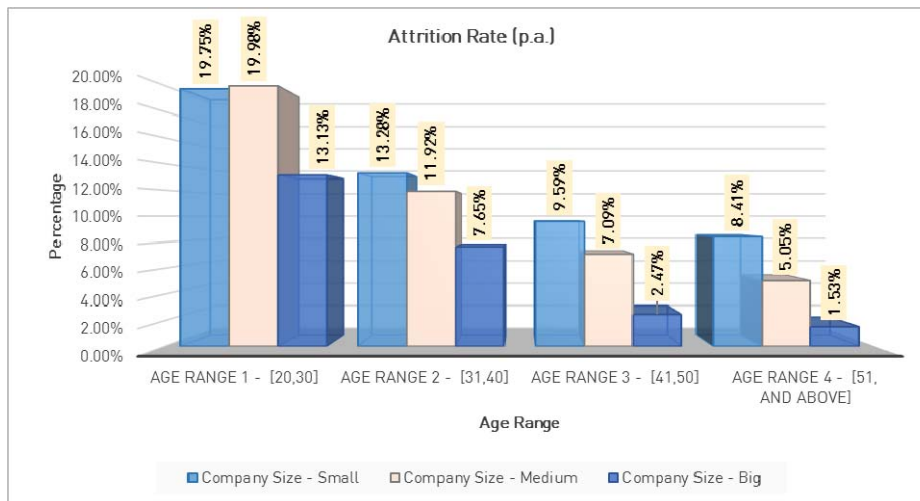
Sector - Services			
Range	Attrition Rate (p.a.)	Range	Attrition Rate (p.a.)
Age Range 1 - [20,30]	19.96%	Service Range 1 - [0,1]	23.36%
Age Range 2 - [31,40]	13.35%	Service Range 2 - [2,4]	15.93%
Age Range 3 - [41,50]	5.95%	Service Range 3 - [5,10]	10.59%
Age Range 4 - [51, and above]	2.40%	Service Range 4 - [11,20]	3.76%
		Service Range 5 - [21, and above]	2.37%



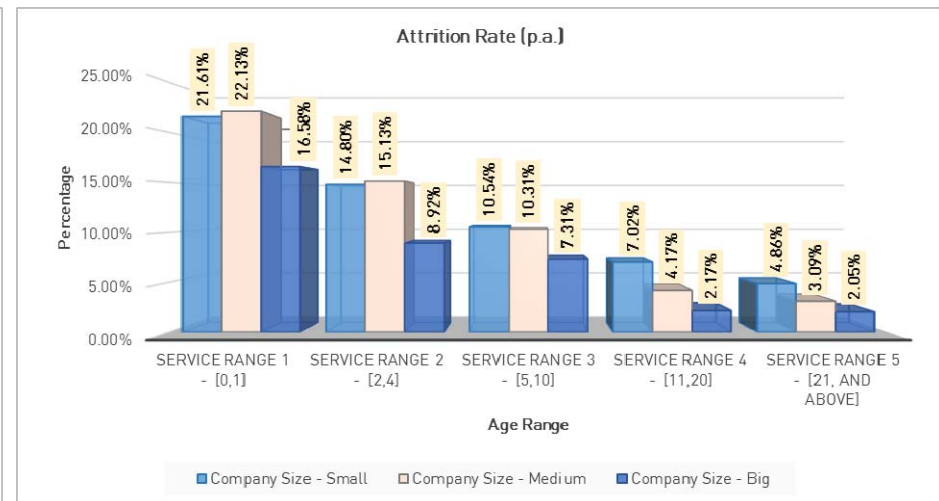
# Results – Company Size Specific



Attrition Rate – Age and Company size Specific



Attrition Rate – Service and Company size Specific



It can be observed from the above age and service range that attrition rates are specifically higher when the service and age of an employee is below 5 and 30 years respectively. Hence, it is recommended to use a staggered attrition rate when required, would project the liability more appropriately.

# Impact of Attrition Rate on the Projected Benefit Obligation



## Illustration 1

- **Age** : 32 years
- **Service** : 2 years
- **Retirement Age** : 58 years
- **Monthly Salary** : INR 85,000
- **Benefit Scheme** : Gratuity  
15 days salary for each year of service with a limit of INR 2,000,000/-. Benefit is payable on death or on resignation or on retirement.
- **Vesting Period\*** : 5 years

\* Applicable on retirement or on resignation

## Accrued Amount

=  $15/26 * 2 * 85000$  capped at 2mio  
= INR 98,077

## Valuation Assumptions

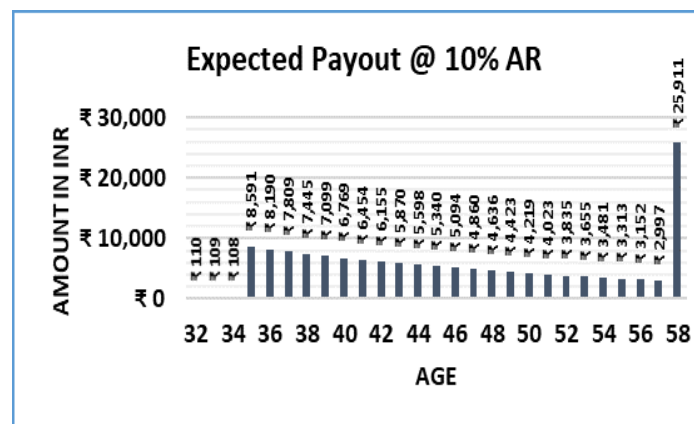
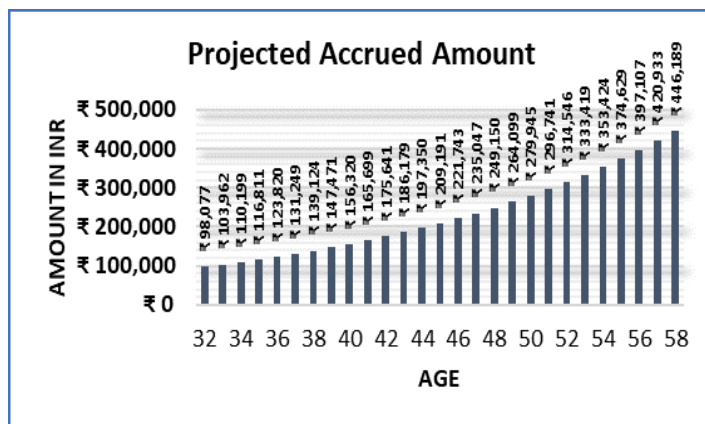
Financial Assumptions  
Discount Rate : 8.00% p.a.  
Salary Escalation : 6.00% p.a.

Demographic Assumptions  
Mortality Rate – 100% IALM2006-08  
Attrition Rate – 10.00% p.a.

## Industry Information – Pharmaceutical

## Method of Valuation

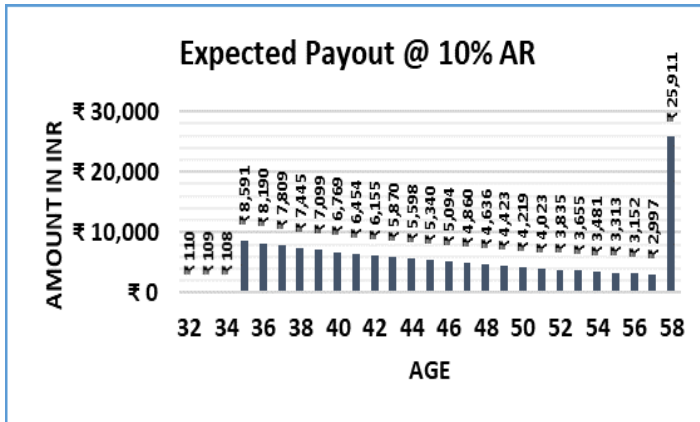
Projected Unit Credit Method



Accrued Amount	INR 98,077
Projected Benefit Obligation	INR 58,727
Ratio	59.88% of Accrued Amount

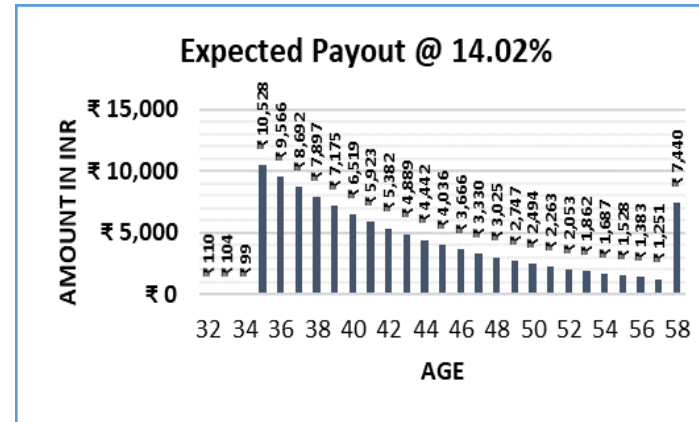
Discounted Mean Term 11.11 Years

# Impact of Attrition Rate on the Projected Benefit Obligation



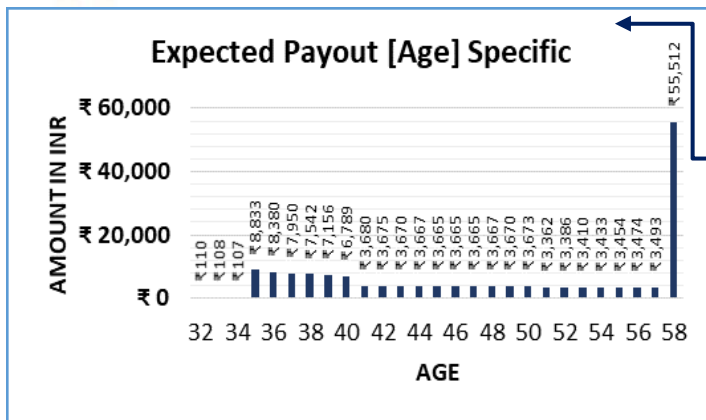
Proj. Benefit Obligation INR 58,727

Discounted Mean Term 11.11 Years



Proj. Benefit Obligation INR 52,941

Discounted Mean Term 9.16 Years



Proj. Benefit Obligation INR 56,752

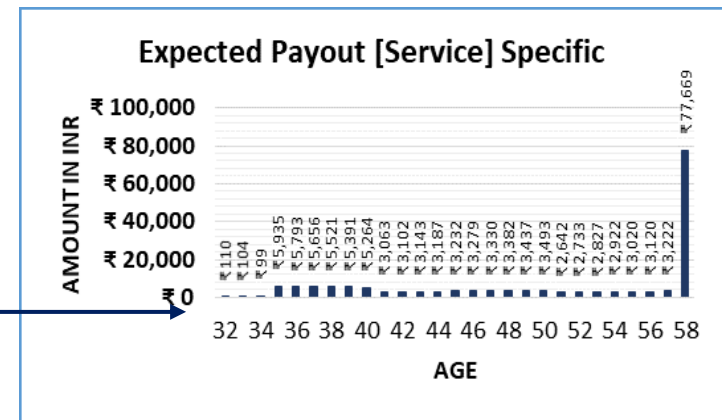
Discounted Mean Term 11.98 Years

Attrition Rate – Age Specific

Age Range	Attrition Rate (p.a.)
[20,30]	19.00%
[31,40]	10.44%
[41,50]	5.88%
[51, and above]	5.33%

Attrition Rate – Service Specific

Service Range	Attrition Rate (p.a.)
[0,1]	21.23%
[2,4]	13.92%
[5,10]	7.87%
[11,20]	4.61%
[21, and above]	3.29%



Proj. Benefit Obligation INR 48,582

Discounted Mean Term 13.85 Years

# Impact of Attrition Rate on the Projected Benefit Obligation



## Illustration 2

- **Age** : 44 years
- **Service** : 8 years
- **Retirement Age** : 58 years
- **Monthly Salary** : INR 125,000
- **Benefit Scheme** : Gratuity  
20 days salary for each year of service.  
Benefit is payable on death or on resignation or on retirement.

- **Vesting Period\*** : 5 years

\* Applicable on retirement or on resignation

## Accrued Amount

$$= 20/26 * 8 * 125000$$

$$= \text{INR } 769,231$$

## Valuation Assumptions

Financial Assumptions

Discount Rate : 8.00% p.a.

Salary Escalation : 6.00% p.a.

Demographic Assumptions

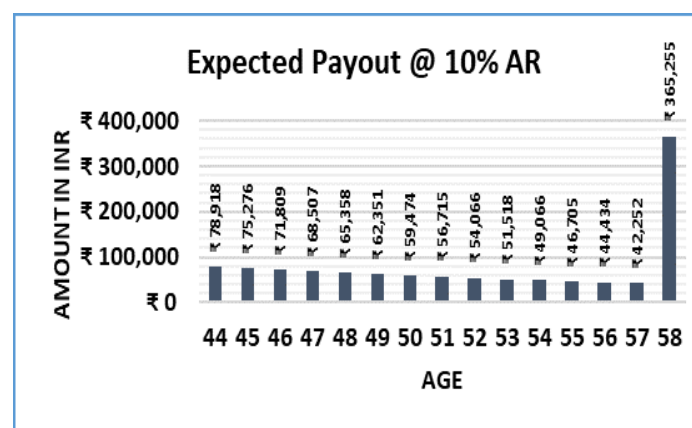
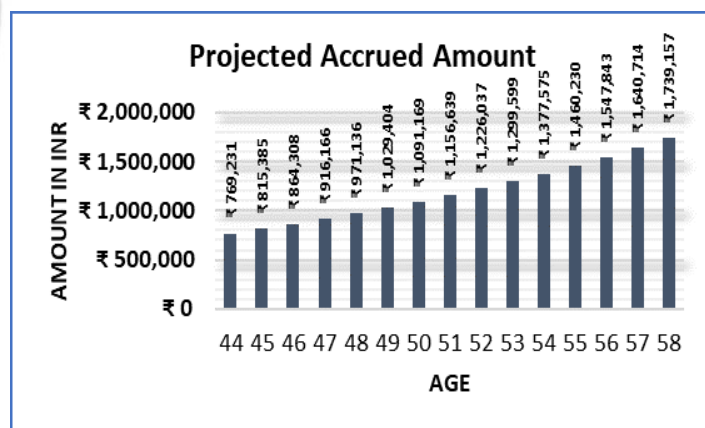
Mortality Rate – 100% IALM2006-08

Attrition Rate – 10.00% p.a.

## Industry Information – Pharmaceutical

## Method of Valuation

Projected Unit Credit Method



Accrued Amount

INR 769,231

Projected Benefit Obligation

INR 680,889

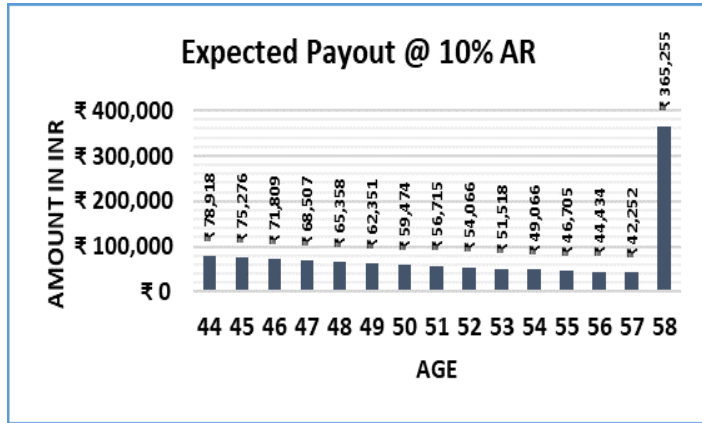
Ratio

88.52% of Accrued Amount

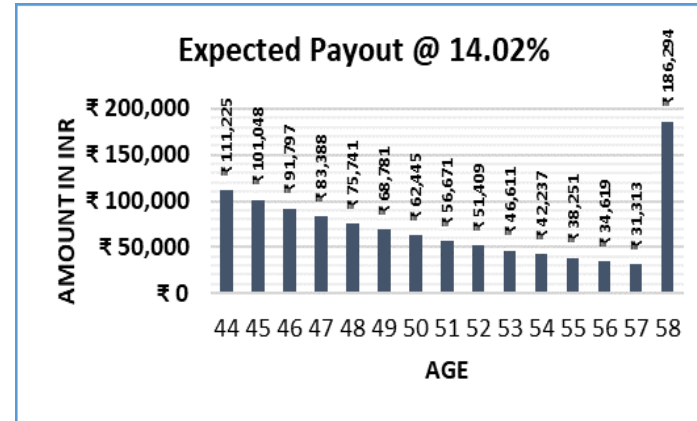
Discounted Mean Term

7.29 Years

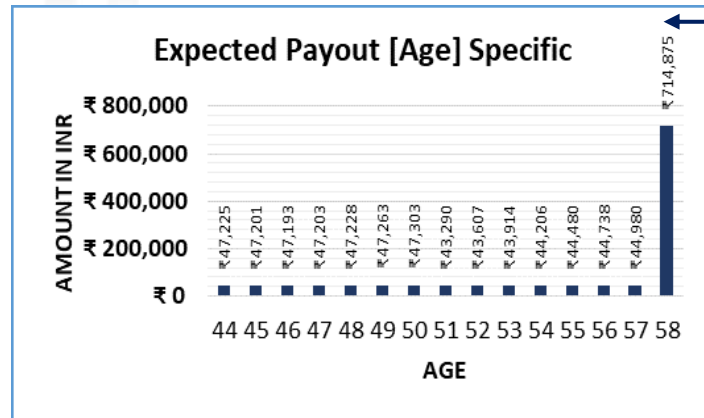
# Impact of Attrition Rate on the Projected Benefit Obligation



Proj. Benefit Obligation INR 680,889  
 Discounted Mean Term 7.29 Years



Proj. Benefit Obligation INR 700,334  
 Discounted Mean Term 5.83 Years



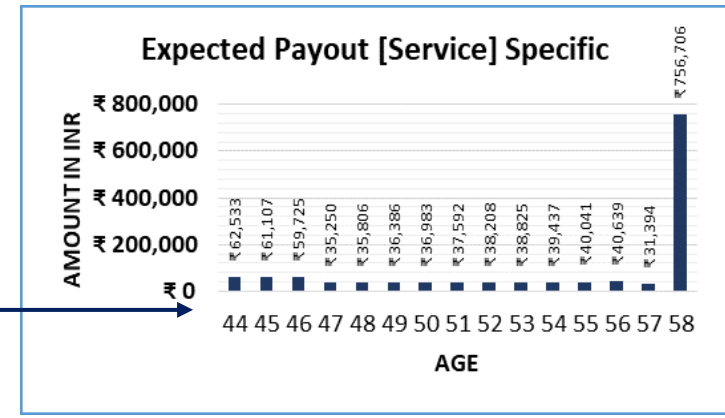
Proj. Benefit Obligation INR 653,581  
 Discounted Mean Term 9.46 Years

Attrition Rate – Age Specific

Age Range	Attrition Rate (p.a.)
[20,30]	19.00%
[31,40]	10.44%
[41,50]	5.88%
[51, and above]	5.33%

Attrition Rate – Service Specific

Service Range	Attrition Rate (p.a.)
[0,1]	21.23%
[2,4]	13.92%
[5,10]	7.87%
[11,20]	4.61%
[21, and above]	3.29%



Proj. Benefit Obligation INR 655,439  
 Discounted Mean Term 9.28 Years

# Conclusion



The selection of actuarial assumptions is one of the critical parameter for determining employee benefit liabilities as in turn it determines the company's expense. Choice of appropriate assumptions will help in minimizing volatility in the expenses and liability.

Accounting standard on employee benefits prescribes management's responsibility to set assumptions, but it is the onus of the auditor to express an opinion on annual accounts which should reflect a true and fair view. Therefore they also play a major role in setting assumptions. We therefore recommend that a discussion between the Company (Finance and HR representatives), the Actuary and the Auditor should occur at an early stage in the valuation process. This ensures all stakeholders are in agreement in this key area.

It should be remembered that since the assumptions are long term in nature (other than discount rate which is driven by market yields); we would not expect significant changes in the assumptions year on year. Change should only occur where previous assumptions are not reflecting experience or there has been a change in the management's perception for company's future plans.

In setting the assumption for attrition rate, one must take care that the past may not be always a guide to the future. Even if the past experience can be statistically analyzed to produce some meaningful rates, the future experience of withdrawals will depend on general economic conditions as also the particular conditions affecting the given employer's business. Furthermore, withdrawal rates differ significantly from scheme to scheme and within a scheme from year to year.

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Thank you 😊

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