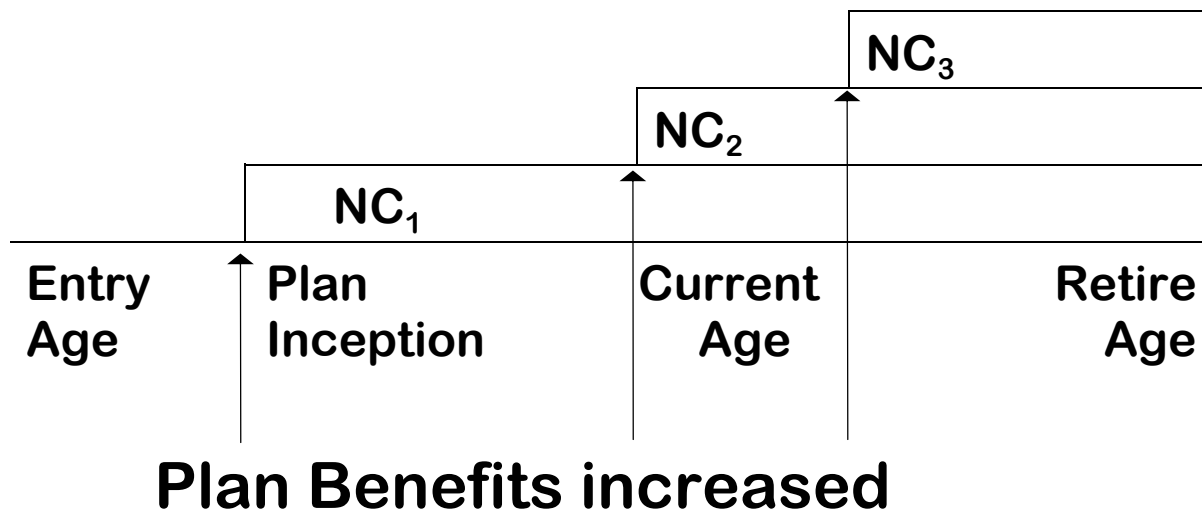


INDIVIDUAL LEVEL PREMIUM

Method defines normal cost as calculated prospectively to fund change in projected benefit over future service only. Use the later of current age, or age at plan inception.



Compared to Entry Age Normal:

- (1) Add piece to last year normal cost
- (2) Plan change does not affect A.L.
- (3) Benefit change due to salary increase is funded via normal cost

INDIVIDUAL LEVEL PREMIUM

IA = later of hire age, or age at plan inception

Initial layer of normal cost:

$$\text{Initial NC} = \frac{(\text{PROJ BEN}) \ddot{a}_{RA}^{(12)} (v^{RA-IA} {}_{RA-IA}p_{IA})}{\ddot{a}_{IA:RA-IA}}$$

Additional layer - plan change (at age CA):

$$\Delta \text{NC} = \frac{(\Delta \text{PROJ BEN}) \ddot{a}_{RA}^{(12)} (v^{RA-CA} {}_{RA-CA}p_{CA})}{\ddot{a}_{CA:RA-CA}}$$

INDIVIDUAL LEVEL PREMIUM

IA = later of hire age, or age at plan inception

Multiple layers of normal cost:

$$\text{Total NC} = \text{initial NC} + \sum_{t=IA+1}^{CA} \Delta \text{NC}_t$$

Usual retrospective definition of AL:

$$\text{AL} = \sum_{t=IA}^{CA-1} \text{NC}_t (1+i)^{CA-t} / {}_{CA-t}p_t$$

INDIVIDUAL LEVEL PREMIUM

Similar definitions for pay related plan, which should fund NC as level percentage of payroll.

This has never been tested on the exam.

Initial layer of normal cost:

$$\text{Initial NC\%} = \frac{(\text{PROJ BEN}) \ddot{a}_{\text{RA}}^{(12)} (v^{\text{RA-IA}})_{\text{RA-IA}} p_{\text{IA}}}{\text{PAY}_{\text{IA}} {}^s \ddot{a}_{\text{IA:RA-IA}}}$$

Additional layer - plan change (age CA):

$$\Delta \text{NC\%} = \frac{(\Delta \text{PROJ BEN}) \ddot{a}_{\text{RA}}^{(12)} (v^{\text{RA-CA}})_{\text{RA-CA}} p_{\text{CA}}}{\text{PAY}_{\text{CA}} {}^s \ddot{a}_{\text{CA:RA-CA}}}$$

INDIVIDUAL LEVEL PREMIUM

Change in benefits does not affect the accrued liability. Reason is that benefit changes are funded through the normal cost, over future service.

Since the accrued liability represents past service, it is not affected. See demonstration on next page.

INDIVIDUAL LEVEL PREMIUM ACCRUED LIABILITY DEMONSTRATION

Employee is age CA

Before plan change, have NC_B and AL_B

After plan change, have NC_A and AL_A

$$\begin{aligned} NC_A &= NC_B + \Delta NC \\ \Delta NC &= \frac{(\Delta \text{Proj Ben}) \cdot N_{RA}^{(12)} / D_{CA}}{(N_{CA} - N_{RA}) / D_{CA}} \end{aligned}$$

$$PVBEN_A = PVBEN_B + (\Delta \text{Proj Ben}) N_{RA}^{(12)} / D_{CA}$$

$$\begin{aligned} PVNC_A &= NC_A * (N_{CA} - N_{RA}) / D_{CA} \\ &= (NC_B + \Delta NC) * (N_{CA} - N_{RA}) / D_{CA} \\ &= PVNC_B + (\Delta \text{Proj Ben}) N_{RA}^{(12)} / D_{CA} \end{aligned}$$

$$\begin{aligned} AL_A &= PVBEN_A - PVNC_A \\ &= PVBEN_B + (\Delta \text{Proj Ben}) N_{RA}^{(12)} / D_{CA} \\ &\quad - PVNC_B - (\Delta \text{Proj Ben}) N_{RA}^{(12)} / D_{CA} \\ &= PVBEN_B - PVNC_B \\ &= AL_B \end{aligned}$$

COMPARE THREE COST METHODS

	UNIT CREDIT	ENTRY AGE NORMAL	INDIVIDUAL LEVEL PREMIUM
Method Type (Ben vs. Cost)			
Method Definition: (Formula)			
Initial Accrued Liability (Y/N)			
Effect of Plan Change (Y/N)	NC: AL:	NC: AL:	NC: AL:
Effect of Salary Change (G/L?) Y/N			

COMPARE THREE COST METHODS

GIVEN:

- Sole proprietor earning \$200,000
- No mortality assumption
- Salary scale losses in 10 years pre-65

Which cost method does the “best” job of funding for this owner-employee’s retirement benefits?

- Unit Credit
- Entry Age Normal
- Individual Level Premium