

### Question #119

Answer: A

Let  $\pi$  denote the premium.

$$\begin{aligned}L &= b_T v^T - \pi \bar{a}_{\overline{T}|} = (1+i)^T \times v^T - \pi \bar{a}_{\overline{T}|} \\ &= 1 - \pi \bar{a}_{\overline{T}|}\end{aligned}$$

$$E[L] = 1 - \pi \bar{a}_x = 0 \quad \Rightarrow \quad \pi = 1/\bar{a}_x$$

$$\begin{aligned}\Rightarrow L &= 1 - \pi \bar{a}_{\overline{T}|} = 1 - \frac{\bar{a}_{\overline{T}|}}{\bar{a}_x} = \frac{\delta \bar{a}_x - (1 - v^T)}{\delta \bar{a}_x} \\ &= \frac{v^T - (1 - \delta \bar{a}_x)}{\delta \bar{a}_x} = \frac{v^T - \bar{A}_x}{1 - \bar{A}_x}\end{aligned}$$