

4. A whole life annuity issued to (50) pays continuously at an annual rate of $5 \cdot (1.06)^t$ at time t . Determine the APV of this annuity, given ${}_t p_{50} = \left(\frac{40-t}{40}\right)^3$ and $i = 0.06$.

5. For a 4-state model, transitions can occur back and forth among states 0, 1, and 2. Once state 3 is entered, there is no transition out from it. You are given:

(i) ${}_5 p_{80}^{00} = 0.539$ ${}_5 p_{80}^{01} = 0.173$ ${}_5 p_{80}^{02} = 0.070$ ${}_5 p_{80}^{03} = 0.218$

(ii) Using $i = 5\%$: $\bar{a}_{85}^{02} = 0.3403$ $\bar{a}_{85}^{12} = 1.0883$ $\bar{a}_{85}^{22} = 3.2367$

(iii) $i = 5\%$

Determine the actuarial present value of a 5-year deferred whole life annuity, issued to an 80-year old in state 0, that pays continuously at a rate of 10,000 per year while in state 2.