Case 1: If given unprimed probabilities (no p's)

Then \[ nq_x = \sum_j nq_x \]

Then \[ np_x = 1 - nq_x \]

Case 2: If given primed probabilities

Then \[ np_x = \prod_j np_x \]

Then \[ nq_x = 1 - np_x \]

Relating Primed \& Unprimed Probabilities

3 Cases:

Case 1: (CF) There is a constant force of

departure each year for each decrement

Case 2: (MUDD) There is a uniform distribution of

departures each year in the multiple decrement model

\[ t \cdot q_x = t \cdot q_x \]

\[ \Rightarrow t \cdot q_x = t \cdot q_x \]
Case 3: (SUDP) There is a uniform distribution of departures each year in the associated single decrement model.

\[ t^q(i) = t \cdot q^i(i) \]

\[ t^{\Delta q} = t \cdot \Delta q \]

and \[ t^p_x \cdot \mu_{x+t} = \text{constant} = q^i(i) \]

Formulas:

CF and MUDD give the same formula:

\[ t^p_x = \left[ t^p_x \right] \]

\[ \left( \frac{\frac{q(i)}{b(i)}}{b(i)} \right) \]

Commit to Memory