

STAT 475
Quiz 1
Spring 2018
 January 25, 2018

Kinnick Long Term Care Insurance Company sells a three year term policy for (65). It pays 50,000 at the end of the year if a person enters a long term care facility during a year. It pays 25,000 at the end of the year if a person dies during the year. Only one benefit will be paid based on the first decrement that occurs. The policy has an annual premium payable at the beginning of each year until a benefit is paid.

Junyu, who is the chief actuary for Kinnick, wants to use a double decrement table to price this policy. Decrement (1) is entry into a long term care facility. Decrement (2) is death. He uses the following independent rates from associated single decrement tables to develop the multiple decrement table:

x	$q_x^{(1)}$	$q_x^{(2)}$
65	0.1	0.04
66	0.2	0.06
67	0.3	0.08

Junyu assumes that decrements are uniformly distributed in the associated single decrement tables.

Junyu also uses an interest rate of 8% in his calculations.

1. (6 points) Complete the following double decrement table. Be sure to show your work.

x	$l_x^{(\tau)}$	$d_x^{(1)}$	$d_x^{(2)}$
65	100,000		
66			
67		18,712.1664	4418.1504

2. (7 points) The net premium determined using the equivalence principle is 9300 to the nearest 100. Calculate it to the nearest 1.
3. (7 points) Kinnick decides to charge a premium of 10,000. Let L_0 be the loss at issue for this insurance based on the premium of 10,000. Assume that there are no expenses. Calculate the $E[L_0]$.

4. (Bonus – 5 points) The cost of a month's stay in the Long Term Care Facility is about 8000. Why should Kinnick be concerned about selling this policy? Suggest a change to the benefits that would help minimize the risk with this policy.