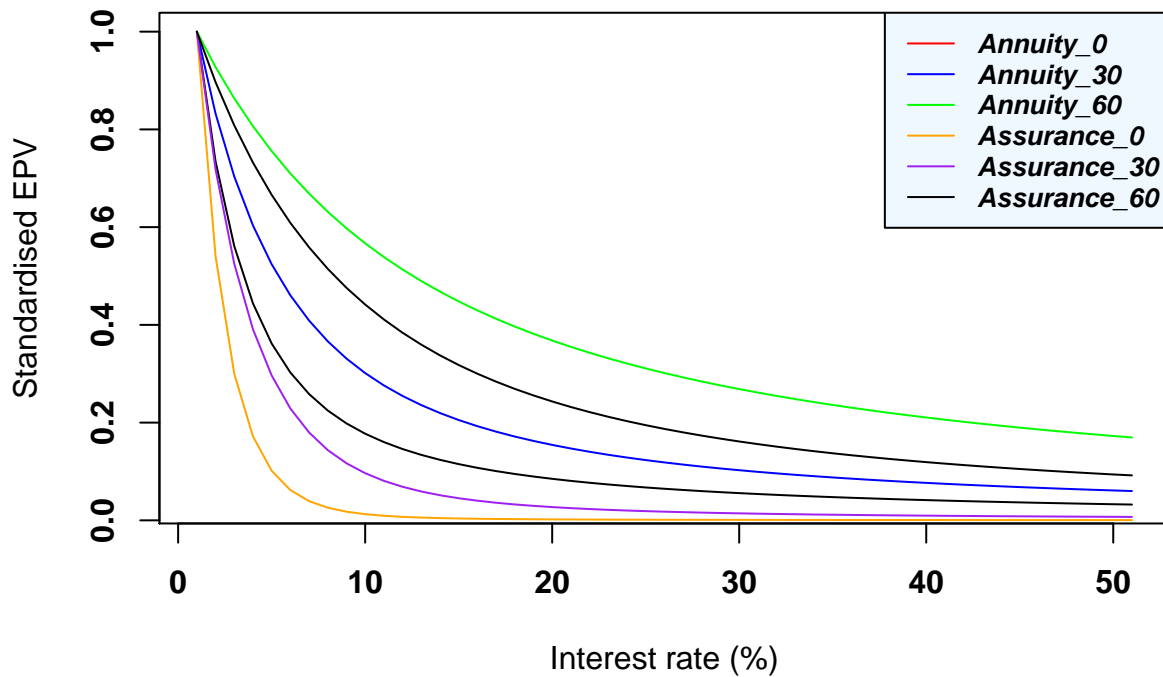


Sensitivity Analysis - Interest Rate vs EPV

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Interest rate's effect on EPV



The whole life annuity product, when compared with the whole life assurance product tends to have a higher standardised EPV (Expected Present Value) over all interest rates at each respective age ie. at $x = 0, 30, 60$. This is due to ${}_kp_x$ having a higher value than ${}_k|q_x$ at all interest rates and ages since ${}_k|q_x = {}_kp_x - {}_{k+1}p_x$.

We can see that as age(x) decreases, both the a_x and A_x curves tend to drop more quickly and seem to plateau. This is due to the fact that at lower ages there are much more values used to calculate a_x and A_x since there are more ages between them and the maximum age. This means for the low interest rates all these values will contribute towards computing a_x and A_x but as i increases and k increases the discount rate will tend towards 0 meaning values as k increases make less and less of a contribution in calculating a_x and A_x and causes a rapid dip in these values as age increases.

The product standardised expected present values, A_0, A_{30} and a_0 all are very sensitive to interest rate changes and plateau very quickly, dropping below a standardised EPV of 0.2 by interest rates of 4%, 7% and 9% respectively. The standardised expected present values a_{30}, A_{60} and a_{60} on the other hand are not as sensitive and do not plateau as fast, dropping below a standardised EPV of 0.2 by interest rates of 16%, 25% and 43% respectively.