FIN 513: Homework #6

Due on Tuesday, March 13, 2018

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Problem 1

(a) Since yield-to-maturity is a discount rate which discount "promised" payoff to current price, F is represented as $F = \frac{1}{1+y}$.

(b) Under risk-neutral measure, all expected return is risk-free. Therefore, F is represented as $F = \frac{p\times 1+(1-p)\times 0}{1+R} = \frac{p}{1+R}$.

(c) Since expected return of the bond is e, and there is true survival probability π, F is represented as $F = \frac{\pi\times 1+(1-\pi)\times 0}{1+e} = \frac{\pi}{1+e}$.

(d) Since $F = \frac{p}{1+R} = \frac{\pi}{1+e}$, $\frac{\pi}{p} = \frac{1+R}{1+e}$. Furthermore, because the bond is risky, e must be greater than R, therefore the inequality $\frac{\pi}{p} = \frac{1+R}{1+e} < 1$ holds.

(e) From (d), risk-neutral survival probability is always greater than true survival probability. Since given true probability is 97% and it is almost 100%, risk-neutral survival probability might be 100%. It means that under risk-neutral measure, expected payoff of bond is almost equal to 1. Therefore, yield-to-maturity is almost same as risk-free rate, and the bond price is almost equal to face value discounted at risk-free rate. Furthermore, since expected return of asset is 12%, and firm's asset is not risk-free, risk-free rate must be less than 12%. Therefore, bond price must le larger than $\frac{1}{1.12}$.

Problem 2