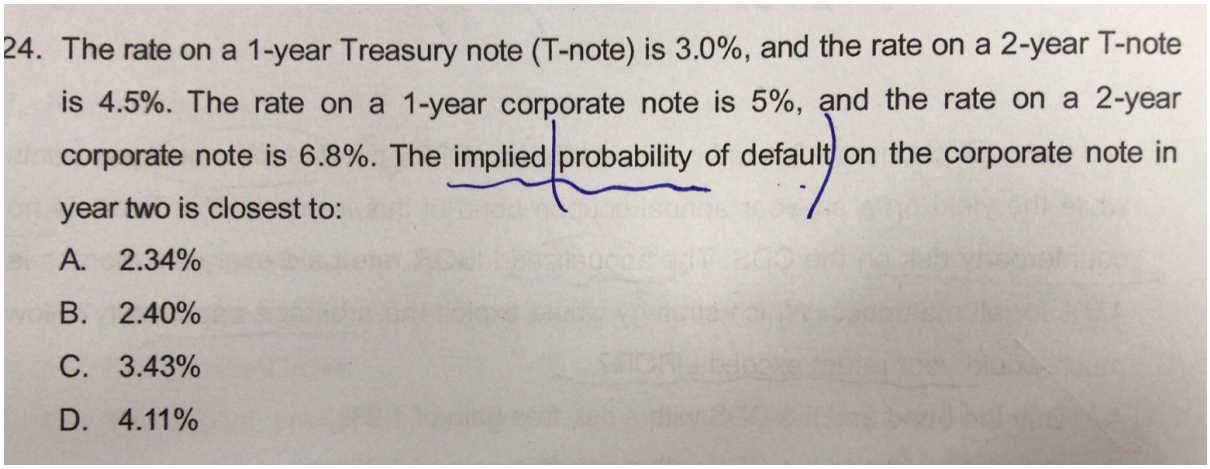

24. The rate on a 1-year Treasury note (T-note) is 3.0%, and the rate on a 2-year T-note is 4.5%. The rate on a 1-year corporate note is 5%, and the rate on a 2-year corporate note is 6.8%. The implied probability of default on the corporate note in year two is closest to:

A. 2.34%

B. 2.40%

C. 3.43%

D. 4.11%

我开始算的是累计违约概率

- 第二年的累计违约概率
  - $(1+4.5\%)^2 = (1+6.8\%)^2 \times (1-\text{PD}) \rightarrow PD = 4.2\%$
- 第一年的违约概率
  - $(1+3\%) = (1+5\%) \times (1-\text{PD}) \rightarrow PD = 1.9\%$

  二者之差是 2.3%

这题目问的是在**第二年违约的概率**，要算出 forward rate

- T-bond 是用于参考的，算出 risk-free
  - $(1+3\%) \times (1+\text{x}) = (1+4.5\%)^2 \rightarrow 1+x = 1.0602$
- Corporate bond 是计算真实的
  - $(1+5\%) \times (1+\text{y}) = (1+6.8\%)^2 \rightarrow 1+y = 1.0863$
- 利用 FV 等价法
  - $(1+\text{x}) = (1+\text{y}) \times (1-\text{PD}) + \text{PD} \times 0 \rightarrow \text{PD} = 1 - \frac{1+\text{y}}{1+\text{x}} = 2.4\%$

24. Answer: B

We can solve for the 1-year rate, one year forward for each of the T-notes and corporate bonds. Then we can use these two rates to determine the implied probability of default on the corporate note during the second year.

$$1+r_{f_{1,2}} = \frac{(1+0.045)^2}{(1+0.030)} = 1.0602$$

$$1+y_{f_{1,2}} = \frac{(1+0.068)^2}{(1+0.05)} = 1.0863$$

$$\frac{1}{1.0863} = \frac{1}{1.0602} \times (1-\pi)$$

$$\Rightarrow \pi = 2.40\%$$