FINM2063 Introduction to Finance

Chapter 3 Exercises

Solutions

1. a. 

b. 



1. a. rRF1 = 5%, and



Solving for rRF in Year 2, we obtain

rRF in Year 2 = (7.5% x 2) - 5% = 10%.

b. For riskless bonds under the expectations theory, the interest rate for a bond of any maturity is rRF = r\* + average inflation over n years. If r\* = 3%, we can solve for IPn:

Year 1: rRF1 = 3% + Infl1 = 5%;

Infl1 = Year 1 expected inflation = 5% - 3% = 2%.

Year 2: rRF2 = 3% + Infl2 = 10%;

Infl2 = expected inflation = 10% - 3% = 7%.

Note also that the average inflation rate is (2% + 7%)/2 = 4.5%, which, when added to r\* = 3%, produces the yield on a 2‑year bond, 7.5%. Therefore, all of our results are consistent.

Alternative solution: Solve for the inflation rates in Year 1 and Year 2 first:

rRF = r\* + IP

Year 1: 5% = 3% + IP1; IP1 = 2%, thus Infl1 = 2%.

Year 2: 7.5% = 3% + IP2; IP2 = 4.5%.

IP2 = (Infl1 + Infl2)/2

4.5% = (2% + Infl2)/2

Infl2 = 7%.

Then solve for the yield on the one-year bond in the second year:

Year 2: rRF in Year 2 = 3% + 7% = 10%.

1. Because the only difference between Bond A and Bond B is the term to maturity, the difference in the yields of these two bonds must be the result of their MRPs. Thus,

MRP = (8% - 7.5%)/5 = 0.1% per year

If the yields for Bond A and Bond B are deflated by the MRPs, then the interest rate on the risky bonds is 7 percent:

Bond A yield = 8.0% = rRF + MRP + DRP = (5.5% + DRP) + 0.1%(10) = (5.5% + DRP) + 1.0%.

Deflating the yield on Bond A by MRP = 1.0%, gives 7.0% = 5.5% + DRP.

Thus, DRP = 7.0% - 5.5% = 1.5%

Bond B yield = 7.5% = rRF + MRP + DRP = (5.5% + DRP) + 0.1%(5) = (5.5% + DRP) + 0.5%.

Deflating the yield on Bond B by MRP = 0.5%, gives 7.0% = 5.5% + DRP.

Thus, DRP = 7.0% - 5.5% = 1.5%

1. a. - c.

Arithmetic

1‑Year Average Maturity Estimated

Expected Expected Risk Interest

Year Inflation Inflation r\* Premium Rates

1 3% 3.0% 3% 0.0% 6.0%

2 5 4.0 3 0.2 7.2

3 4 4.0 3 0.4 7.4

4 8 5.0 3 0.6 8.6

5 3 4.6 3 0.8 8.4

d. 10 2 3.3 3 1.8 8.1

20 2 2.65\* 3 2.0 7.65

Average inflation for the 20-year bond = [3.0 + 5.0 + 4.0 + 8.0 + 3.0 + 15(2.0)]/20 = 53/20 = 2.65

e. Yield curve: