

lecture3p_Xichen

Problem 2

(a) The relevant forward rate: ${}_1f_2$, which is between year 1 and 3.

(b) The forward rate:

$$(1 + {}_1f_2)^2 = \frac{(1 + r_3)^3}{1 + r_1}$$
$${}_1f_2 = 0.08 = 8\%$$

The relevant forward rate is 8%.

(c) The strategy to lock in the future rate:

In year 0:

Short one-year zero-coupon bonds for $\frac{1M}{1+r_1}$ dollars, and then use the money received from the sell to long three-year zero-coupon bonds for $\frac{1M}{1+r_1}$ dollars.

No net initial investment because the cash inflow equals cash outflow, which is $\frac{1M}{1+r_1}$.

In year 1:

There will be a cash outflow of 1M dollars.

At year 3:

There will be a cash inflow of $\frac{1M \times (1+r_3)^3}{1+r_1}$ dollars.

This implies the rate ${}_1f_2$ between years 1 and 3.