BKE Chapter 14

Exercise 13

5% annual coupon, 20 year maturity, YTM = 8%, assume $1000 Face Value.

a) **HPR? One year horizon, and will sell at YTM = 7% after year.**

$$P_0 = 50/1.08 + 50/(1.08)^2 + \ldots + 50/(1.08)^{19} + 1000/(1.08)^{20} = 705.46$$

$$P_1 = 50/1.07 + 50/(1.07)^2 + \ldots + 50/(1.07)^{19} + 1000/(1.07)^{19} = 793.29$$

Thus, the HPR is given by the Present Value at year 1, i.e. 1 year has passed, of the coupon payments thus far plus the difference in the price the bond will trade at now to that at acquisition:

$$HPR = [50 + (793.29 - 705.46)]/705.46 = 19.54\%$$

Exercise 14

7% semi-annual coupon (every 182 days), on 15. of Jan & July. The *TWSJ* reports the 'ask' as being 100:02% of par on 30.01. What is the invoice price?

Price 100:02% = 100 2/32% = 1000.0625

Invoice Price = reported price + accrued interest

= 1000.0625 + (15/182)70/2 =

= 1000.0625 + 2.8846

= 1002.9471

Exercise 15

Current yield is 9% and YTM is 10%. Selling above or below par?

Current yield is annual income as percentage of price paid.

If the current yield is less than the YTM then price appreciation must compensate for a lower current relative to lifetime yield. Thus, the bond must be selling below par.

Exercise 16

Coupon more or less than 9%?

Less. If C/P = 9% and P < M => C/M < C/P = 9%

Exercise 18

20 year zero coupon with YTM of 8% and M = 1000.

Imputed interest income in first, second, and last year of bond's life?

Year	until maturity	Const. Yield Value	Imputed Int.
t = 0	20	$1000/1.08^{20} = 214.55$	-
t = 1	19	$1000/1.08^{19} = 231.71$	231.71-214.55
t = 2	18	$1000/1.08^{18} = 250.25$	18.54
t = 19	1	1000/1.08 = 925.93	-
t = 20	0	1000	74.07

Exercise 22

2-Year bond, M = 1000, annual coupon of 100, and price is par value.

- What is the YTM?

If traded at par value, then the YTM must be the same as the coupon rate, i.e. 100/1000 = 10%.

- Realised compound yield if the interest rate next year is

a) 8% b) 10% c) 12% ?

The realized compound yield is that effective annual growth rate that Equates the future value (including interest from reinvestment) of an income stream with the initial outlay; Here:

$1000(1+y)^2 = [1000+100+100(1+r)]$,

where *y* is the yield and *r* is the rate of interest that applies to funds that can be reinvested (coupon payments) before the bond expires (here the interest earned on the first coupon payment)

r	Total proceeds	*y* = Realised YTM =(Proceeds/1000) -1
8	1208	$(1208/1000)^{1/2} - 1 = 9.91\%$
10	1210	$(1210/1000)^{1/2} - 1 = 10\%$
12	1212	$(1212/1000)^{1/2} - 1 = 10.09\%$

Note, the Realised YTM equals the YTM if the reinvestment rate equals the coupon and the price is at par value.

Exercise 23

Zero-coupon (risk free) bond has YTM = Realised YTM.

Why?

No coupons to re-invest, thus proceeds are independent of any interest rates for reinvestment.

Exercise 24

April 15; 10% semi-annual coupon (15.1. and 15.07). In *TWSJ* price quoted as 101:04. If bought today, what price paid?

invoice price =

101 4/32% of par + accrued interest for half a period

= 1010.125 + ½ * ½ *10/100 *1000 = 1035.125