FIP - ASSIGNMENT 2

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Q1. The effective annual yield on the semi-annual coupon bond is 8.16%. If the annual coupon bonds are to sell at par, they must offer the same yield, which will require an annual coupon of 8.16%.

Q2.

a) $r1 = (110/106.8) - 1 = 3.00\%$
$101.93 = [5/(1 + r1)] + [105/(1 + r2)^2] \Rightarrow r2 = 4.00\%$
$111.31 = [10 /(1 + r1)] + [10 /(1 + r2)^2] + [110 /(1 + r3)^3] \Rightarrow r3 = 6.00\%$

b) $f2 = [(1 + r2)^2] /[(1 + r1) - 1] = 5.0\%$

Q3.

a) Price = PV of cash flows = $100(1 +r)/ (1+r) + 100(1 +r)^2/ (1 +r)^2 + \cdots = 400.00$
b) Duration = $(1 + 2 + 3 + 4)/4 = 2.5$ years
c) Put 50% in each. Then the duration of your liability = 2.5 = duration of your assets = $0.5(1)+0.5(4)$

Q4.

a) T-bills are only for 1 to 6 months; they have the smallest duration.
b) the entire value of the treasury strip is in the principal repayment in the distant future; it
c) has the highest duration and is most sensitive to a change in the interest rate.
d) despite having the same maturity as (b), (c) has 5.5% coupon payments that dampen its
e) sensitivity to interest rate changes.
f) higher coupon payment is equal to lower duration

Q6. In the event that the underwriter buys the securities from the corporate client, it expects to be the full chance of being not able to exchange the bonds at the specified contribution cost. At the end of the day, the underwriter bears the gamble of loan cost development between the hour of procurement and the season of resale. For long development bonds, it is for the most part a fact that its span is likewise lengthy. Subsequently, securities with long developments are more presented to loan fee development risk. Subsequently, the financier requests a bigger spread (higher endorsing expenses) between the price tag what's more, specified offering cost.

Q7. I disagree because floater moves with market rates.

Q8.

a) Given, C = 0.06($1,000) / 2 = $30, n = 2(10) = 20 and r = 0.15 / 2 = 0.075 & the present value of the coupon payments is: $305.835
The present value of the par or maturity value of $1,000 is:
235.413. Thus, the price of the bond (P) = $305.835 + $235.413 = $541.25.

b) if 15% = Thus, the price of the bond (P) = $305.835 + $235.413 = $541.25.
if 16% =Thus, the price of the bond (P) = $294.544 + $214.548= $509.09.
(509.09 - 541.25)/541.25 = -5.9%

c) Given, C = 0.06($1,000) / 2 = $30, n = 2(10) = 20 and r = 0.05 / 2 = 0.025
Thus, the price of the bond (P) = $467.675 + $610.271 = $1,077.95.
The price of the bond (P) = $446.324 + $553.676 = $1,000.00.

d) The bond price falls by
($1,000.00 - $1,077.95) / $1,077.95 = (−0.072310) or -7.23%.
We can say that there is more volatility in a low-interest-rate environment because there was a greater fall since 7.23% > 5.94%.

Q9.

a) Step 1: Compute the total coupon payments plus the interest on interest, assuming an annual reinvestment rate of 9.4%, or 4.7% every six months. The coupon payments are $45 every six months for five years or ten periods (the planned investment horizon). Applying equation (3.7), the total coupon interest plus interest on interest is
= 45[{(1.047)^10 - 1}/.047 = 45(12.40162) = $558.14

b) Determining the projected sale price at the end of five years, assuming that the required yield to maturity for two-year bonds is 11.2%, is accomplished by calculating the present value of four coupon payments of $45 plus the present value of the maturity value of $1,000, discounted at 5.6%. As seen below, the projected sale price is $961.53.

projected sale price = present value of coupon payments + present value of par value =

C[{(1-(1/1+r)^n)}/r) + [M/(1+r)^n

45[{(1-(1/1.056)^4)}/0.056] + [1000/1.056^4]

45[3.4970813] + 1000[0.8041634] = 961.53

c) Adding the amounts in steps 1 and 2 gives total future dollars of

$558.14 + $961.53 = $1,519.67.

d) To obtain the semi-annual total return, compute the following:

[total future dollars / purchase price of bonds]^1/n - 1

=[1519.67/1000]^1/10 - 1

=1.042738 - 1 = 0.042738

or 4.2738%

e) Double 4.2738%, for a total return of about 8.55%.

Q10. Total return = yield to maturity. Hence, the total return is 8%.

Q11. I agree since, when a bond has no coupon, the duration is equal to its maturity. Therefore, the effect on price will be the same regardless of interest rates.

Q12. I agree because when interest rates are low, Macaulay is barely affected according to the equation.

Q13. Duration does a good job of estimating an asset's percentage price change for a small change in yield. However, it does not do as good a job for a large change in yield. The percentage price change due to convexity can be used to supplement the approximate price change using duration.

Q14.

a) If interest rates change by 50 basis points, the portfolio will change by approximately 4.53%.
b) The contribution to portfolio duration for each bond is shown in the last column of the above table.
c) The assumption is that the interest rates for all bonds change by the same number of basis points.

Q15.

a) The graphical depiction of the relationship between the yield on bonds of the same credit quality but different maturities. Usually constructed from observations of prices and yields in the Treasury market.
b) Treasury securities are free from default risk. The Treasury market is the largest and most active bond market offering the fewest problems in terms of illiquidity and infrequent trading.

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