Q3) Staind, Inc., has 7.5% coupon bonds on the market that have 10 years left to maturity. The bonds make annual payments. If the YTM on these bonds is 8.75%, what is the current bond price?

The price of any bond is the PV of the interest payment, plus the PV of the par value. Notice this problem assumes an annual coupon. The price of the bond will be:

P = $75({1 – [1/(1 + .0875)]10 } / .0875) + $1,000[1 / (1 + .0875)10] = $918.89

We would like to introduce shorthand notation here. Rather than write (or type, as the case may be) the entire equation for the PV of a lump sum, or the PVA equation, it is common to abbreviate the equations as:

PVIF*R,t* = 1 / (1 + *r)t*

PVIFA*R,t*= ({1 – [1/(1 + *r)*]*t* } / *r* )

Q4) Ackerman Co. has a 9% coupon bonds on the market with nine years left to maturity. The bonds make annual payments. If the bond currently sells for $934, what is its YTM?

Here we need to find the YTM of a bond. The equation for the bond price is:

P = $934 = $90(PVIFA*R%*,9) + $1,000(PVIF*R*%,9)

Notice the equation cannot be solved directly for *R*. Using a financial calculator, we find:

*R* = YTM = 10.15%

Q5) Kiss the Sky Enterprises has bonds on the market making annual payments, with 13 years to maturity, and selling for $1,045. At this price, the bonds yield 7.5%. What must the coupon rate on the bonds?

Here we need to find the coupon rate of the bond. All we need to do is to set up the bond pricing equation and solve for the coupon payment as follows:

P = $1,045 = *C*(PVIFA7.5%,13) + $1,000(PVIF7.5%,36)

Solving for the coupon payment, we get:

*C* = $80.54

The coupon payment is the coupon rate times par value. Using this relationship, we get:

Coupon rate = $80.54 / $1,000 = .0805 or 8.05%

Q6) Grohl Co. issued 11-year bonds a year ago at a coupon rate of 6.9%. The bonds make semiannual payments. If the YTM on these bonds is 7.4%, what is the current bond price?

To find the price of this bond, we need to realize that the maturity of the bond is 10 years. The bond was issued one year ago, with 11 years to maturity, so there are 10 years left on the bond. Also, the coupons are semiannual, so we need to use the semiannual interest rate and the number of semiannual periods. The price of the bond is:

P = $34.50(PVIFA3.7%,20) + $1,000(PVIF3.7%,20) = $965.10

Q24)

a) what is the relationship between the price of a bond and its YTM?

b) Explain why some bonds sell at a premium over par value while other bonds sell at a discount. What do you know about the relationship between the coupon rate and the YTM for premium bonds? What about for discount bonds? For bonds selling at par value.

c) what is the relationship the current yield and YTM for premium bonds? For discount bonds? For bonds selling at par value.

*a*. The bond price is the present value of the cash flows from a bond. The YTM is the interest rate used in valuing the cash flows from a bond.

*b*. If the coupon rate is higher than the required return on a bond, the bond will sell at a premium, since it provides periodic income in the form of coupon payments in excess of that required by investors on other similar bonds. If the coupon rate is lower than the required return on a bond, the bond will sell at a discount since it provides insufficient coupon payments compared to that required by investors on other similar bonds. For premium bonds, the coupon rate exceeds the YTM; for discount bonds, the YTM exceeds the coupon rate, and for bonds selling at par, the YTM is equal to the coupon rate.

*c*. Current yield is defined as the annual coupon payment divided by the current bond price. For

premium bonds, the current yield exceeds the YTM, for discount bonds the current yield is less than the YTM, and for bonds selling at par value, the current yield is equal to the YTM. In all cases, the current yield plus the expected one-period capital gains yield of the bond must be equal to the required return.