

Essays solution



Interest Rates and Bond Valuation Terminology

1. Face value/par value - the original issue price (the amount borrowed).
2. Maturity date - date on which loan has to be repaid.
3. Coupon interest rate - original interest rate on the bond.
4. Coupon payment - the fixed interest payment on the bond.
5. YTM= required rate of return. ?

Bonds pay fixed coupon payments at fixed intervals and the face value at maturity. ? there is an inverse relationship between the price of an investment and the rate of return on the investment - if you pay a higher price for an investment your rate of return must be lower (holding all other factors constant) ?

If the YTM = coupon rate the bond will sell for the face value (i. e. current price = face value). ? If the YTM > coupon rate the bond will sell for a discount (yield goes up, price goes down). If the YTM < coupon rate the bond will sell for a premium (yield goes down, price goes up).

Identify the three most important determinants of the price of a bond. Describe the effect of each?

The three factors affecting the price of a bond are - coupon - yield - term to maturity. T > The relationship between price and coupon is a direct one - the higher the coupon, the higher the price. The relationship between price and yield is an inverse one - the higher the yield the lower the price, all other factors held constant. The relationship between price and maturity is not so clearly evident. Price changes resulting from changes in yields will be more pronounced, the longer the term to maturity.

Given a change in the level of interest rates, discuss how two major factors will influence the relative change in price of individual bonds.

For a given change in the level of interest rates, two factors that will influence the relative change in bond prices are the coupon and maturity of the issues. Bonds with longer maturity and/or lower coupons will have the greatest price changes in response to a given change in interest rates. Other factors likewise cause differences in price volatility, including the call features, but these factors are typically much less important.

What is the purpose of bond ratings? Answer Bond ratings provide a very important service in the market for fixed income securities because they provide the fundamental analysis for thousands of issues.

The rating agencies conduct extensive analyses of the intrinsic characteristics of the issue to determine the default risk for the investor and inform the market of the analyses through their ratings.

What are the important assumptions made when you calculate the promised YTM? Answer The most crucial assumption that the investor makes is that cash flows will be received in full (i. e. investors hold the bond to maturity) and reinvested at the promised yield.

You expect interest rates to decline over the next 6 months.

What kind of bonds do you want in your portfolios in term of duration and explain your reasoning for this choice. Answer Given that you expect interest rates to decline during the next six months, you should choose bonds that will have the largest price increase, that is, bonds with long durations.

Which of the following bonds will have the greatest percentage increase in value if all interest rates decrease by 1 percent?

1. 20-year, zero coupon bond.
2. 10-year, zero coupon bond.
3. 20-year, 10 percent coupon bond.
4. 20-year, 5 percent coupon bond. Answer

Since a zero coupon bond's price today is determined just by the NPV of its par value, all of its payment is discounted for the maximum amount of time, whereas a coupon bond has many payments discounted for less than the maximum amount of time. Therefore, a zero coupon bond is most affected by interest rate changes. So, the longest zero coupon bond is the correct answer, which is statement.

1. Which of the following statements is most correct?
2. All else equal, long-term bonds have more interest rate risk than short-term bonds.
3. All else equal, high-coupon bonds have less reinvestment rate risk than low-coupon bonds.
4. All else equal, short-term bonds have less reinvestment rate risk than do long-term bonds.
5. All of the statements above are correct.

Statement a since high-coupon bonds have more reinvestment rate risk than low-coupon bonds and short-term bonds have more reinvestment rate risk than do long-term bonds.

Two years ago you bought a government bond for \$1,000 because you liked the 10% p. a. coupon interest payment that you would receive for 10 years. Interest on the bond is paid annually. Two years later, when the market interest rate has fallen to 8% p. a. what is the value of your bond? Solution

Since coupon rate is 10% and YTM has fallen to 8%, it must be the case that the price of this bond has increased (remembering the inverse relationship between bond price and yield). The Morgan Corporation has two different bonds currently outstanding. Bond M has a face value of \$20,000 and matures in 20 years. The bond makes no payments for the first six years, then pays \$800 every six months over the subsequently eight years, and finally pays \$1,000 every six months over the last 6 years. Bond N also has a face value of \$20,000 and a maturity of 20 years; it makes no coupon payments over the life of the bond.

If the required return on both these bonds is 8 percent compounded semiannually, what is the current price of bond M? and bond N? Solution The price of any bond (or financial instrument) is the PV of the future cash flows. Even though Bond M makes different coupon payments, to find the price of the bond, we just find the PV of the cash flows. The PV of the cash flows for Bond M is: $PM = \$800(PVIFA_{4\%, n=16})(PVIF_{4\%, n=12}) + \$1,000(PVIFA_{4\%, n=2})(PVIF_{4\%, n=28}) + \$20,000(PVIF_{4\%, n=40})$ $PM = \$13,117.88$ Notice that for the coupon payments of \$800, we found the PVA for the coupon payments, and then discounted the lump sum back to today.

Bond N is a zero coupon bond with a \$20,000 par value; therefore, the price of the bond is the PV of the par, or: $PN = \$20,000(PVIF_{4\%, 40}) = \$4,165.78$

3. Bond P is a premium bond with a 9 percent coupon. Bond D is a 5 percent

coupon bond currently selling at a discount. Both bonds make annual payments, have a YTM of 7 percent, and have five years to maturity. What is the current yield for bond P? for bond D? if interest rates remain unchanged, what is the expected capital gains yield over the next year for bond P? for bond D? Explain your answers and the interrelationship among the various types of yields.

Solution To find the capital gains yield and the current yield, we need to find the price of the bond. The current price of Bond P and the price of Bond P in one year is: P: $P_0 = \$90(PVIFA_{7\%, 5}) + \$1,000(PVIF_{7\%, 5}) = \$1,082.00$ $P_1 = \$90(PVIFA_{7\%, 4}) + \$1,000(PVIF_{7\%, 4}) = \$1,067.74$ Current yield = $\$90 / \$1,082.00 = .0832$ or 8.32% The capital gains yield is: Capital gains yield = $(\text{New price} - \text{Original price}) / \text{Original price}$ Capital gains yield = $(\$1,067.74 - 1,082.00) / \$1,082.00 = -0.0132$ or -1.32% The current price of Bond D and the price of Bond D in one year is:

D: $P_0 = \$50(PVIFA_{7\%, 5}) + \$1,000(PVIF_{7\%, 5}) = \$918.00$ $P_1 = \$50(PVIFA_{7\%, 4}) + \$1,000(PVIF_{7\%, 4}) = \$932.26$ Current yield = $\$50 / \$918.00 = 0.0545$ or 5.45% Capital gains yield = $(\$932.26 - 918.00) / \$918.00 = 0.0155$ or 1.55% All else held constant, premium bonds pay a high current income while having price depreciation as maturity nears; discount bonds pay a lower current income but have price appreciation as maturity nears. For either bond, the total return is still 7%, but this return is distributed differently between current income and capital gains.