Watters Umbrella Corp. issued 15-year bonds 2 years ago at a coupon rate of 8.8 percent. The bonds make semiannual payments. If these bonds currently sell for 106 percent of par value, what is the YTM?

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| Here we are finding the YTM of a semiannual coupon bond. The bond price equation is: |

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| P = $1,060 = $44(PVIFA*R%*,26) + $1,000(PVIF*R%*,26) |
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| Since we cannot solve the equation directly for *R*, using a spreadsheet, a financial calculator, or trial and error, we find: |
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| *R* = 4.024% |
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| Since the coupon payments are semiannual, this is the semiannual interest rate. The YTM is the APR of the bond, so: |
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| YTM = 2 × 4.024% |
| YTM = 8.05% |

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| Rhiannon Corporation has bonds on the market with 20.5 years to maturity, a YTM of 8.1 percent, and a current price of $1,074. The bonds make semiannual payments. |

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| What must be the coupon rate on these bonds? |

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| 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: |

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| P = $1,074 = *C*(PVIFA4.05%,41) + $1,000(PVIF4.05%,41) |

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| Solving for the coupon payment, we get: |

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| *C* = $44.23 |

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| Since this is the semiannual payment, the annual coupon payment is: |

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| 2 × $44.23 = $88.46 |

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| And the coupon rate is the annual coupon payment divided by par value, so: |

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| Coupon rate = $88.46 / $1,000 |
| Coupon rate = .0885, or 8.85% |

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| Laurel, Inc., and Hardy Corp. both have 7 percent coupon bonds outstanding, with semiannual interest payments, and both are priced at par value. The Laurel, Inc., bond has three years to maturity, whereas the Hardy Corp. bond has 16 years to maturity. |

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| If interest rates suddenly rise by 2 percent, what is the percentage change in the price of these bonds? |

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| Any bond that sells at par has a YTM equal to the coupon rate. Both bonds sell at par, so the initial YTM on both bonds is the coupon rate, 7 percent. If the YTM suddenly rises to 9 percent: |

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| PLaurel | = | $35(PVIFA4.5%,6) | + | $1,000(PVIF4.5%,6) | = | $948.42 |
| PHardy | = | $35(PVIFA4.5%,32) | + | $1,000(PVIF4.5%,32) | = | $832.11 |

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| The percentage change in price is calculated as: |

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| Percentage change in price = (New price – Original price) / Original price |

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| ΔPLaurel% | = | ($948.42 – 1,000) / $1,000 | = | –.0516, or –5.16% |
| ΔPHardy% | = | ($832.11 – 1,000) / $1,000 | = | –.1679, or –16.79% |

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| If the YTM suddenly falls to 5 percent: |

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| PLaurel | = | $35(PVIFA2.5%,6) | + | $1,000(PVIF2.5%,6) | = | $1,055.08 |
| PHardy | = | $35(PVIFA2.5%,32) | + | $1,000(PVIF2.5%,32) | = | $1,218.49 |

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| ΔPLaurel% | = | ($1,055.08 – 1,000) / $1,000 | = | +.0551, or +5.51% |
| ΔPHardy% | = | ($1,218.49 – 1,000) / $1,000 | = | +.2185, or +21.85% |

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| All else the same, the longer the maturity of a bond, the greater is its price sensitivity to changes in interest rates. Notice also that for the same interest rate change, the gain from a decline in interest rates is larger than the loss from the same magnitude change. For a plain vanilla bond, this is always true. |

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| The Starr Co. just paid a dividend of $1.40 per share on its stock. The dividends are expected to grow at a constant rate of 5 percent per year, indefinitely. Investors require a return of 12 percent on the stock. |

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| What is the current price? |
| What will the price be in three years? |

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| The constant dividend growth model is: |
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| P*t* = D*t* × (1 + *g*) / (*R* − *g*) |
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| So, the price of the stock today is: |
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| P0 = D0(1 + *g*) / (*R* − *g*) |
| P0 = $1.40(1.05) / (.12 − .05) |
| P0 = $21.00 |

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| The dividend at Year 4 is the dividend today times the FVIF for the growth rate in dividends and four years, so: |
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| P3 = D3(1 + *g*) / (*R* − *g*) |
| P3 = D0(1 + g)4 / (*R* − *g*) |
| P3 = $1.40(1.05)4 / (.12 − .05) |
| P3 = $24.31 |

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| The next dividend payment by ECY, Inc., will be $2.04 per share. The dividends are anticipated to maintain a growth rate of 7 percent, forever. The stock currently sells for $41 per share. |

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| What is the required return? |

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| We need to find the required return of the stock. Using the constant growth model, we can solve the equation for *R*. Doing so, we find: |
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| *R* = (D1 / P0) + *g* |
| *R* = ($2.04 / $41.00) + .07 |
| *R* = .1198, or 11.98% |

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| Gruber Corp. pays a constant $8.45 dividend on its stock. The company will maintain this dividend for the next 15 years and will then cease paying dividends forever. The required return on this stock is 13 percent. |

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| What is the current share price? |

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| The price of any financial instrument is the PV of the future cash flows. The future dividends of this stock are an annuity for 15 years, so the price of the stock is the PVA, which will be: |
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| P0 = $8.45(PVIFA13%,15) |
| P0 = $54.61 |

Bucksnort, Inc., has an odd dividend policy. The company has just paid a dividend of $8 per share and has announced that it will increase the dividend by $5 per share for each of the next five years, and then never pay another dividend. If you require a return of 11 percent on the company’s stock, how much will you pay for a share today?

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| The price of a stock is the PV of the future dividends. This stock is paying five dividends, so the price of the stock is the PV of these dividends using the required return. The price of the stock is: |
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| P0 = $13 / 1.11 + $18 / 1.112 + $23 / 1.113 + $28 / 1.114 + $33 / 1.115 |
| P0 = $81.17 |

You own a portfolio that has $3,300 invested in Stock *A* and $4,300 invested in Stock *B*. If the expected returns on these stocks are 11 percent and 14 percent, respectively, what is the expected return on the portfolio?

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| The expected return of a portfolio is the sum of the weight of each asset times the expected return of each asset. The total value of the portfolio is: |

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| Portfolio value = $3,300 + 4,300 |
| Portfolio value = $7,600 |

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| So, the expected return of this portfolio is: |

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| E(*RP*) = ($3,300 / $7,600)(.11) + ($4,300 / $7,600)(.14) |
| E(*RP*) = .1270, or 12.70% |

You own a portfolio that is 35 percent invested in Stock *X*, 20 percent in Stock *Y*, and 45 percent in Stock *Z*. The expected returns on these three stocks are 8 percent, 16 percent, and 12 percent, respectively. What is the expected return on the portfolio?

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| The expected return of a portfolio is the sum of the weight of each asset times the expected return of each asset. So, the expected return of the portfolio is: |
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| E(*RP*) = .35(.08) + .20(.16) + .45(.12) |
| E(*RP*) = .1140, or 11.40% |

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| Based on the following information: |

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|  |  | | | Rate of Return If State Occurs | | | | | |
| State of | Probability of | | |  | | | | | |
| Economy | State of Economy | | | Stock A | | | Stock B | | |
| Recession |  | .15 |  |  | .04 |  | – | .15 |  |
| Normal |  | .61 |  |  | .07 |  |  | .14 |  |
| Boom |  | .24 |  |  | .12 |  |  | .31 |  |
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| Calculate the expected return for the two stocks.   |  | | --- | | Calculate the standard deviation for the two stocks. |  |  | | --- | | The expected return of an asset is the sum of the probability of each state occurring times the rate of return if that state occurs. So, the expected return of each stock is: |      |  | | --- | | E(*RA*) = .15(.04) + .61(.07) + .24(.12) | | E(*RA*) = .0775, or 7.75% |      |  | | --- | | E(*RB*) = .15(−.15) + .61(.14) + .24(.31) | | E(*RB*) = .1373, or 13.73% |      |  | | --- | | To calculate the standard deviation, we first need to calculate the variance. To find the variance, we find the squared deviations from the expected return. We then multiply each possible squared deviation by its probability, and then add all of these up. The result is the variance. So, the variance and standard deviation of each stock are: |      |  | | --- | | σ*A*2 = .15(.04 − .0775)2 + .61(.07 − .0775)2 + .24(.12 − .0775)2 | | σ*A*2 = .00068 |      |  | | --- | | σ*A* = .000681/2 | | σ*A* = .0261, or 2.61% |      |  | | --- | | σ*B*2 = .15(−.15 − .1373)2 + .61(.14 − .1373)2 + .24(.31 − .1373)2 | | σ*B*2 = .01954 |      |  | | --- | | σ*B* = .019541/2 | | σ*B* = .1398, or 13.98% | |