Cheatography

Coec 371 Cheat Sheet

by Spazztaco via cheatography.com/95917/cs/20777/

Formula

Price of Longer Maturity Coupon Paying Bond

$P = c/r*(1 - 1/(1+r)^t) + ParValue/(1+r)^t$

Price of Zero Coupon Bond

$P = ParValue/(1+r)^t$

Price of Short Maturity Coupon Paying Bond

$P = Coupon/(1+r)^t + (ParValue+Coupon)/-(1+r)^t$

Nominal Growth rate of Cash Flows

$i = (1+GrowthRate)*(1+InflationRate) - 1$

Real Return Adjusted for Inflation

$r = (1+i)/(1+Inflation)$

Present Value of Cash Flows

$PV = Cash * ((1+i)^{t-1}/(1+DiscountRate)^{t-1} + (1+i)^t/(1+DiscountRate)^t + ...)$

Computing YTM

Rates = Flat; Rates = YTM.

Rates =/= Flat; Solve for Price, Swap Rates for Y and solve for Y

Discount Factors (D) for Zero Coupon Bonds

Price/100

Discount Factor (D) for Coupon Paying Bonds

$Price = C*D[1] + (ParValue+C)D[2]$

Calculation for Spot Rates Using Discount Factor

$r = (1/D)/^T -1$

For semiannual multiply answer by 2

Calculating Price with Discount Rates

$P = C*D[1] + C*D[2] + (ParValue+C)D[3]$

For semiannual C/2

Macaulay Definition

$D = (1+r)/r - \{[(1+r) + T(C-R)] / (C[(1+r)^T - 1] +r)\}$

Where R = Flat Rate Or YTM.
When Semiannual r/2 and c/2, divide final answer by 2

Modified Duration

$D^* = D/1+r$

Formula (cont)

$P[1]*(1+EAR)^T = P[T]$

Converting Monthly APR to Semiannual

$(1+APR/12)^6 -1$

Calculating for Spot Rates using Price Formula

Price = ParValue/(1+r) then solve for r

Descriptive

Constructing an Arbitage

e.g:
Year 1 => 100x[1] +5x[2] = 7 {x[3]}

Year 2 => 105x[2] = 107 {x[3]}

Solve for x[1] and x[2]

Computing Realized Returns assuming Dividend Reinvesting

e.g:
Invest $1000, 1000/Share Price = # of Shares

# of Shares + [# of Shares*DividendPayout]/NextSharePrice

Repeat til end of Periods, compute the realized returns

Monthly Payment Questions

Owed Amount = $c/r*[1-1/(1+r)^T]$

Solve for C, Make sure T is in the right format (Monthly Payments, Yearly, Daily)

What is your return if term structure remains flat and you hold for X years?
TSR = Term Structure Rate

$(1+r)^T = R/100$

$R = C*(1+TSR)^{T-1} + C*(1+TSR)^{T-2} +... ...+ C*(1+TSR)^1 + (ParValue + C)$

Plug in R to first equation then solve for small r

Simple Trading Model

Note

Note: Spot Rates = Flat Term Rate.
And Equal to YTM if the rates are flat.
If not, YTM is found using the formula to your left.

Present Value of Liabilities

Liabilities * $1/(1+r)^T$

Compute Realized Returns

(P[0] - P[-1])/ P[-1]

Computing Expected Returns

E(R) = (Probability * Return + ...)

Computing Standard Deviation

Sd(R) = Sqrt(Probability*(Return - $E(R)^2$ +...)

Effective Annual Rate (EAR)

Expected Value of Stock

E(V) = P[h]*V[h] + P[l}*V[l]

Ask price so Market Maker breaks even

A =
(P[u]*P[l]*V[l] + P[h]*V[h]) / (P[u]*P[l]+ P[h})

Bid price so Market Maker breaks even

B =
(P[l]*V[l] + P[u]*P[h]*V[h]) / (P[l] + P[u]*P[h]

Bid-Ask Spread

s = A - B

By **Spazztaco**
cheatography.com/spazztaco/

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