

CHAPTER 3 : ASSET CLASSES

Calculate Annual Equivalent rate

Q1. Bank offers an advertised rate of 5% compounded quarterly. What is the AER.

Solution

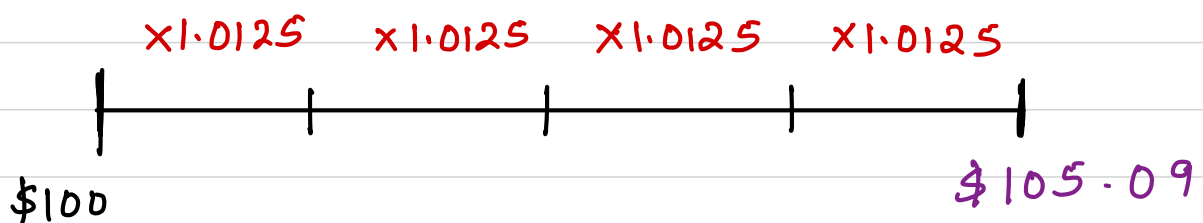
Advertised rate : 5%

Step 1 : Convert to decimals $\rightarrow 0.05$

Step 2 : Adjust for compounding frequency $\rightarrow \frac{0.05}{4} = 0.0125$

Step 3 : Add 1 $\rightarrow 1.0125$

Step 4 : Time-line



$$\text{AER} = 5.09\%$$

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Calculate Forward rate

$$\text{Forward rate} : \text{Spot rate} \times \left[\frac{1 + R_f \text{ price}}{1 + R_f \text{ base}} \right]$$

Example:

$$\text{Spot USD: AUD} = 1.20$$

$$R_f \text{ USD} = 4\%$$

$$R_f \text{ AUD} = 7\%$$

$$\text{1 year forward USD: AUD} = 1.20 \times \frac{(1 + 7\%)}{(1 + 4\%)}$$

$$= 1.20 \times \frac{1.07}{1.04}$$

$$= 1.2346$$

* If question asks 6-month forward then adjust interest rates.

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Calculate flat yield / running yield

$$\text{flat yield} = \frac{\text{annual coupon}}{\text{bond price}}$$

Example

A bond has a coupon rate of 8% and is currently trading at \$92. It has 4 years to maturity. What is the flat yield?

$$\text{flat yield} = \frac{\$8}{\$92} = 8.695\%$$

* While calculating flat yield... years to maturity doesn't matter.

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Calculate gross redemption yield (GRY)

$$\text{GRY} : \frac{\text{annual coupon} + \left(\frac{\text{discount}}{\text{years to maturity}} \right)}{\text{bond price}}$$

* For premium bond subtract instead of adding.

Example

A bond has a coupon rate of 8% and is currently trading at \$94. It has 4 years to maturity. What is the gross redemption yield?

$$\text{GRY} : \frac{8 + \left(\frac{6}{4} \right)}{94}$$

(100 - 94)

$$: \frac{8 + 1.5}{94} = \underline{\underline{10.10\%}}$$

CHAPTER 5: ECONOMICS & INVESTMENT ANALYSIS

Calculation of central tendencies

Example:

Yearly returns: 1%, -6%, 4%, 4%, 9%, 7%.

$$\begin{aligned} \text{arithmetic mean: } & \frac{1 - 6 + 4 + 4 + 9 + 7}{6} \\ & : 3.167\% \end{aligned}$$

Mode : 4%

Median: -6%, 1%, 4%, 4%, 7%, 9%.



Median = 4%.

Geometric mean → slightly difficult

Calculate geometric mean of 8%, 3%, -5%.

Step 1: write % in decimals : 0.08, 0.03, -0.05

Step 2: add 1 to the decimals : 1.08, 1.03, 0.95

Step 3: Multiply all of them : $(1.08 \times 1.03 \times 0.95)$

Step 4: Take the n^{th} root : $(1.08 \times 1.03 \times 0.95)^{\frac{1}{3}} = 1.0185$

Step 5: Subtract 1 and convert to % = 1.85%

↖
geometric
mean

Practice: Calculate Geo. mean of
10%, 12%, -20%, 30%.

CHAPTER 5

PRESENT AND FUTURE VALUE

$$FV = PV \times (1+i)^n$$

$$PV = \frac{FV}{(1+i)^n}$$

$$\text{Present value of perpetuity} = \frac{PMT}{i}$$

CHAPTER 6: INVESTMENT MGMT

LIST OF FORMULAS

→ CAPM: Required Return = $R_F + \beta (R_m - R_F)$

→ Sharpe ratio = $\frac{R_p - R_F}{\sigma}$

→ Treynor ratio = $\frac{R_p - R_F}{\beta}$

→ Information ratio = $\frac{R_p - R_B}{\text{tracking error}}$ ↗ Benchmark returns

→ Money weighted returns: gets affected by amount invested

→ Time weighted returns: unaffected by amount invested.