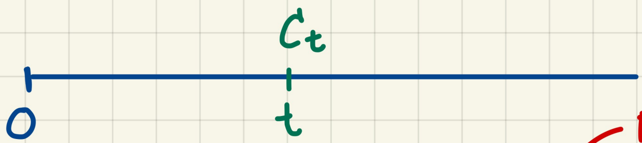
M339W: April 1st, 2022.

"Corporate Finance (4th Ed)" by Berk/DeMarzo

Analyzing the Project.

Our Criterion (w/ out looking @ risk for now!)

Recall: Interest Theory: Maximizing the Net Present Value (NPV).



$$NPV = \sum_t PV_{0,t}(C_t)$$

Now: Estimates of Incremental Cashflow, e.g., expectations under a probability measure

Depends on the cost of capital.

Notation: r... effective annual

Break-Even Analysis.

Keep all but one of the inputs (estimated cashflows and the cost of capital) fixed. Vary the remaining input to find for what value of it the NPV of the project will be zero.

e.g., IRR (Internal Rate of Return), i.e., the yield rate, YTM

e.g., consider a call option; look @ its profit curve; find the final asset price for which the profit is zero; break-even point

27) Consider a two-year project, where the cost of capital is 10%.

$r = 0.10$

effective

There are only three cash flows for this project.

- The first occurs at $t = 0$, and is -100.
- The second occurs at $t = 1$, and is 66.
- The third occurs at $t = 2$, and is X.

NPV = zero

Determine X, the level of the cash flow at $t = 2$, that leads to the project breaking even.

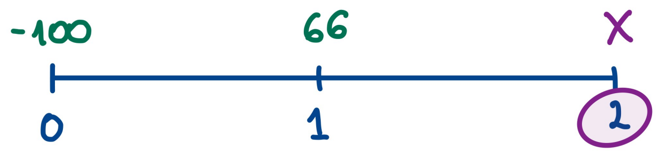
(A) 34.0

(B) 38.4

(C) 44.0

(D) 48.4

(E) 54.0



$$-100 + 66(1.1)^{-1} + X(1.10)^{-2} = 0$$

$$\Rightarrow \quad X = 100(1.1)^2 - 66(1.1)$$

$$= 121 - 72.6 = 48.4 \Rightarrow (D)$$

Expected Return of Portfolio.

Say that there are n different securities in the portfolio.

$i = 1..n$ the indices of the investment components

For every i: R_i ... the (realized simple) return of the i^{th} component (over a specific time period; say, over a year)

R_p ... the realized return of the entire portfolio

beg end

$$R_p := \frac{P_p^{end} - P_p^{beg}}{P_p^{beg}}$$

Compare to the notion of the effective interest rate in interest theory

w/ P_p... the price of the entire portfolio,

i.e.,

$$P_p = \sum_{i=1}^{n} P_i$$

the value of component i

extra notes

$$\boxed{R_p = \sum_{i=1}^{n} w_i \cdot R_i}$$

w/ $\boxed{w_i = \frac{P_i^{beg}}{P_p^{beg}}}$ ✓

w_i ... the portfolio weight of component i (deterministic)

$\Rightarrow$ the expected return:

$$\boxed{\mathbb{E}[R_p] = \sum_{i=1}^{n} w_i \cdot \mathbb{E}[R_i]}$$