PORTFOLIO MANAGEMENT
CLASS - 2

Ambiguous Questions :-

Ambiguous

CASE STUDY 2

Q1.

P	(x) Return $\frac{(D_1 + P_1 - P_0)}{P_0} \times 100$	Px	$P(x-\bar{x})^2$
0.25	24%	6	36
0.50	12%	6	0
0.25	0	0	36
		12%	72 (%^{2})

$\therefore \bar{x} = \Sigma Px$
$= 12\%$

$\therefore \sigma x = \sqrt{72} = 8.49\%$

Ambiguous

Q1. E(R) ?

Sol^n:- 12% (c)

Q2. Sd ?

Sol^n:- 8.49% (b)

Ambiguous
Q3. Should investor accept buyback of deb at FV?

Sol^n:- d)

Logically will not accept this ans. ⟸

opportunity cost

logic
If deb me then will earn 10%.
but if buyback
then from somewhere else getting scheme
@10% then accept buyback at same risk

Ambiguous

CASE STUDY 3

P	Alpha Return (X)	Beta ~~(X)~~ PX	$P(X-\bar{X})^2$
0.5	Return = $\frac{100-30+5}{30} \times 100$ = 250%	125	3471.94
0.5	$\frac{25}{30} \times 100$ = 83.33%	41.67	3472.78
		166.67	~~7037.78~~ 6944.72

$\therefore \sigma x = \sqrt{\Sigma P(X-\bar{X})^2}$

$= \sqrt{6944.72}$

$= 83.33\%$

$\therefore CV = \frac{sd}{mean} \times 100 = \frac{83.33}{166.67} \times 100 = 50\%$

Q1. E(R) of Alpha?

Sol^n: (d) 166.67

Q3. sd on Alpha

Sol^n: (c) 83.33%

Q: CV of Alpha?

Sol^n:- a) 50%

<u>Beta</u> :- (Do it on your own)

P	X (Return)	PX	$P(x-\bar{x})^2$
0.5	53.33%	26.67	488.28
0.5	−9.17%	−4.58%	488.28
		22.08%	976.56

$\therefore \bar{X} = \Sigma px$
$= 22.08\%$

$\therefore \sigma x = \sqrt{976.56}$
$= 31.25\%$

$CV = \frac{sd}{mean} \times 100$

$= \frac{31.25}{22.08} \times 100$

$= 141.53\%$

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Special sum on choosing Efficient Portfolios based on E(R) and Sd :-

Grd Ques
CASE STUDY 1

Compare :-	U	V	Z
	10	10	10
σ	5	6	7

Return same
risk kam hai so V & Z faltu hai

Now compare risk similar hai kya :-

U	X
10	5
5	5

return kam hai so X faltu hai

Q1. Efficient securities :-

b) Securities U, W & Y

Q2. U & W 80% 20% → $\sigma = ?$ $5 \times .8 + 13 \times .2 = 6.6\%$

Perfect ↑ corelation me risk nahi katega

Soln:- 6.6% (c).

MPT → Jab portfolio me lagayenge toh portfolio ka risk W.A nahi ayega usse kam ayega ie. risk katega

Perfect Positive correlation

When $\underline{\sigma = 1}$, there is no benefit of diversification

σP = Weighted Average ~~($\sigma p \neq WA$ when $\sigma \neq 1$)~~

Q3. ~~Return~~

$E(R_p)$ does not depend upon "σ".
$E(R_p)$ always weighted average.

Q3. $E(R_p)$ of U 80% W 20%.

Soln:- $10 \times .8 + 15 \times .2$
$= 11\%$ (b)

Q4. E(R) & σ, which investment preferable?
100% in Y or 80% in U & 20% in W

Soln:- d) 100% in Y is better due to lower risk.

Correlation

- Meaning
- Formula & calculation
- Impact in Portfolio

What is correlation?
- Correlation
- How to calculate σ?
- Impact of σ in a portfolio.

$(a+b)^2 = a^2 + b^2 + 2ab$

$\sigma p = (0.8\sigma x + 0.2\sigma y)$

$R_p = 0.8x + 0.2y$

$E(R_p) = 0.8\bar{x} + 0.2\bar{y}$

$\sigma p^2 = 0.8^2 \sigma x^2 + 0.2^2 \sigma y^2 + 2 \times 0.8\sigma x \times 0.2\sigma$

$\sigma p^2 = wx^2 \sigma x^2 + wy^2 \sigma y^2 + \ldots$

A, B, C

$\sigma p^2 = WA^2 \sigma A^2 + WB^2 \sigma B^2 + WC^2 \sigma C^2 + 2WAWBWC\, r \sigma A \sigma B \sigma C$
$+ 2WAWB\, r_{AB}\, \sigma A \sigma B$
$+ 2WBWC\, r_{BC}\, \sigma B \sigma C$
$+ 2WCWA\, r_{AC}\, \sigma A \sigma C$

$\therefore \sigma p^2 = \underbrace{Wt^2 \sigma i^2}$ → for each stock
$+ \underbrace{2\,wt \times wt \times \boxed{r\, \sigma\, \sigma}}$ → for each pair

$\boxed{r\, \sigma\, \sigma}$ ↓ covariance

Tone :-

$$\boxed{\sigma p^2 = \underbrace{Wt^2 \sigma^2}_{\text{Type I}} + \underbrace{2\, wt\, wt\ \text{covariance}}_{\text{Type II}}}$$

$Wt^2 \sigma^2$ → variance

Conclusion:-

$E(R_p)$ = Weighted Average
↓
Always . . . . no exception

$\sigma p \leq$ Weighted Average (good bcoz we hate risk)
↳ skab? only when $r = +1$ → perfect positive correlation

In real life, $r \neq 1$ → v. good.
↓
$r < 1$

$\therefore \sigma p <$ weighted average
Yaani ki portfolio banane se risk kategа . . . .

∴ Invest in Portfolio . . . . .

Do not put all your money in a single stock

In case study ~~1~~, we had shortlisted 3 stocks → U, W & Y

	U	W	Y
E(R) →	10%	15%	11%
σ →	5%	13%	6%

chalo iska portfolio banate hai
with $W_U = 80\% = 0.8$
$W_W = 20\% = 0.2$

Now, suppose, ρ between U & W $= -0.3$

$\therefore E(R) = 0.8 \times 10 + 0.2 \times 15$
$= 11\%$ → same as "Y"

ρ pe depend nei karta hai hamesha WA

$$\sigma_p^2 = (0.8)^2(5)^2 + (0.2)^2(13)^2 + 2 \times 0.8 \times 0.2 \times (-0.3) \times 5 \times 13$$

$\sigma_p^2 = 16 + 6.76 - 6.24$
$\sigma_p^2 = 16.52$
$\sigma_p = \sqrt{16.52}$
$= 4.06\%$ → But "Y" ka $\sigma = 6\%$ hai

Ex: consider the following two stocks :-

Stocks	E(R)	s.d.
A	10%	5%
B	30%	12%

$r_{AB} = 0.1$

If we construct a portfolio with 60% weight to A & 40% weight to B, calculate :—

i) $E(R_p)$
ii) σp
iii) CV_p

i) $E(R_p) = 10 \times .6 + 30\% \times .4$
$= 6 + 12$
$= 18\%$

ii) $\sigma p^2 = (0.6)^2 \times (5)^2 + (0.4)^2 \times (12)^2 + 2 \times 0.6 \times 0.4 \times 0.1 \times 5 \times 12$
$= 9 + 23.04 + 0.28$
$= 34.92$

$\therefore \sigma p = 5.90\%$

iii) $CV = \frac{sd}{mean} \times 100$

$= \frac{5.90}{18} \times 100 = 32.83\%$

Intelligent

if $r = +1$

$\sigma p = \sqrt{WA^2 \sigma A^2 + WB^2 \sigma B^2 + 2 WA\, WB\, r\, \sigma A\, \sigma B}$

$\sigma p = WA\,\sigma A + WB\,\sigma B - (a+b)$.

But if $r < 1$ $\therefore$ WA se kam aya

$\boxed{\sigma p \le WA\,\sigma A + WB\,\sigma B}$