

PORTFOLIO MANAGEMENT

CLASS 1

HOME WORK SUPPORT

COVERAGE

Question			Answer			Lecture Time
Q. No	Page no.	Book	Q. No	Page no.	Book	
1	118	HOMEWORK ANSWER BOOK	1	118	HOMEWORK ANSWER BOOK	00:00:27 TO 00:02:14
2	119	HOMEWORK ANSWER BOOK	2	119	HOMEWORK ANSWER BOOK	00:02:15 TO 00:02:55
3	120	HOMEWORK ANSWER BOOK	3	120	HOMEWORK ANSWER BOOK	00:02:56 TO 00:03:49
4	120	HOMEWORK ANSWER BOOK	4	121	HOMEWORK ANSWER BOOK	00:03:50 TO 00:05:03

PART I: MODERN PORTFOLIO THEORY (MPT)

EXTRA QUESTION

Topic 2 EXPECTED RETURN AND RISK OF A STOCK

Question 1: **HW ANSWER BOOK PAGE 118**

You are an analyst studying two stocks A and B

Given the past 5 years returns of both A and B

Year	A	B
1	10	-10
2	12	20%
3	8	4%
4	15	28%
5	5	8%

- Find Average return for both A and B
- Compute standard deviation of A and B
- Comment on the return and risk profile of both these companies suppose a client who is risk averse comes to you for suggestion, which stock would you advice for him.

(Source: FOD)

ANSWER: **HW ANSWER BOOK PAGE 118**

- and (ii)

Computation of Average return and Standard Deviation

Year	X	Y	$(X - \bar{X})^2$	$(Y - \bar{Y})^2$
1	10	-10	0	400
2	12	20%	4	100
3	8	4%	4	36
4	15	28%	25	324
5	5	8%	25	4
	$\Sigma X = 50$	50	58	864

$$\therefore \text{Average return of A} = \frac{\Sigma X}{n} = \frac{50}{5} = 10\%$$

$$\therefore \text{Average return of B} = \frac{\Sigma X}{n} = \frac{50}{5} = 10\%$$

$$\text{S.d of A} = \sqrt{\frac{\sum (X - \bar{X})^2}{n}} = \sqrt{\frac{58}{5}} = 3.40\%$$

$$\text{Sd. of B} = \sqrt{\frac{\sum (Y - \bar{Y})^2}{n}} = \sqrt{\frac{864}{5}} = 13.14\%$$

- iii. Even though average return on both the stocks are same there is a huge difference in the S.d. (A→3.40%, B→13.14%). The reason for this huge volatility in B is due to the fact that the return of B changes drastically and therefore they are away from the mean(HIGH VOLATILITY) whereas for stock A all the 5 years return lies somewhat closely around mean(LOW VOLATILITY).

Average return of both the stocks are same, but stock A is less risky as compared to stock B. So any risk averse investor will choose stock A

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Question 2: **HW ANSWER BOOK PAGE 119**

Consider the following data on a stock

	Price at the beginning of the year	Price at end of the year	Dividend for the year
Year 1	300	330	15.00
Year 2	330	350	9.70
Year 3	350	315	10.50
Year 4	315	360	11.70
Year 5	360	380	12.40

- Compare the average return of the stock
- Calculate the S.d. of the stock

(Source: FOD)

ANSWER: **HW ANSWER BOOK PAGE 119**

i.

Year	P ₀	P ₁	D	Return = $\left(\frac{P_1 - P_0 + D}{P_0} \right) \times 100$
1	300	330	15.00	15%
2	330	350	9.70	9%
3	350	315	10.50	-7%
4	315	360	11.70	18%
5	360	380	12.40	9%
				44

$$\therefore \text{Average Return} = \frac{\sum X}{n} = \frac{44}{5} = 8.8\%$$

ii. Calculation of Standard Deviation

X	$(X - \bar{X})^2$
15	38.44
9	0.04
-7	249.64

18	84.64
9	0.04
	372.8

$$s.d = \sqrt{\frac{\sum (x - \bar{x})^2}{n}} = \sqrt{\frac{372.8}{5}} = 8.63\%$$

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Topic 2 EXPECTED RETURN AND RISK OF A STOCK

Question 3: **HW ANSWER BOOK PAGE 120**

You are a stock analyst analyzing an NBFC company. The profitability and stock performance depends upon the decisions taken by the MPC of RBI. Currently the stock is trading at 240. The Probabilities of different decisions and its effect on market price are given below:

Decision	Probability	Share Price
Rate Hike	0.20	280
Rate Cut	0.30	250
Rate unchanged	0.50	265

Calculate the expected return and S.d. of stock

(Source: FOD)

ANSWER: **HW ANSWER BOOK PAGE 120**

Calculation of expected return:

Probability	Price	return(X)	P.X
0.20	280	16.667%	3.33%
0.30	250	4.1667%	1.25%
0.50	265	10.4167%	5.21%

Expected return = $\sum P.X = 9.79\%$

Calculation of S.d.

Probability	Return(X)	$(X - \bar{X})^2$	$P(X - \bar{X})^2$
0.20	16.667%	47.293	9.46
0.30	4.1667%	31.621	9.49
0.50	10.4167%	0.393	0.20
			19.15

$$S.d = \sqrt{\sum P(X - \bar{X})^2} = \sqrt{19.15} = 4.38\%$$

PART I: MODERN PORTFOLIO THEORY (MPT)

EXTRA QUESTION

Topic 2 EXPECTED RETURN AND RISK OF A STOCK

Question 4: HW ANSWER BOOK PAGE 120

Following information about two stocks are given

	Return	Risk
Stock A	12%	9%
Stock B	17%	13%

- Suppose there are two investors, one is highly risk averse and other is less risk averse. Which investor will choose which security?
- If risk aversion level of an investor is not given, which security will an investor choose?
- If risk free rate is given as 6% and level of risk aversion is not given, which security will an Investor choose?

(Source: FOD)

ANSWER: HW ANSWER BOOK PAGE 121

- A highly risk averse investor will choose a stock with low risk even though it is giving low return i.e., stock A.

A less risk averse investor will choose a stock B even though it has higher risk due to high return

- If risk aversion level of an investor is not given, we will select the stock which has low coefficient of variation

Coefficient of variation = $(S.d/mean) \times 100$

$\therefore$ Coefficient of variation of A = $9/12 = 75\%$

Coefficient of variation of B = $13/17 = 76\%$

$\therefore$ Stock A will be selected.

- If risk aversion level is not given and risk free rate is given we will depend on sharpe ratio to select the stock.

Higher sharpe ration is better

$$\text{Sharpe ratio} = \frac{R_x - R_f}{\sigma_x}$$

$\therefore$ Sharpe ratio of A = $\frac{12-6}{9} = 0.67$

$$\therefore \text{Sharpe ratio of B} = \frac{17 - 6}{13} = 0.85$$

$\therefore$ Stock B will be selected