Pinnacle Academy

Chapter Tests

August 2018 Batch

2nd Floor, Florence Classic, 10, Ashapuri Society,
Jain Derasar Road, Akota, Vadodara-20. ph: 98258 561 55

22nd December, 2018

CA Final: New Syllabus

Test of Portfolio Management

Time Allowed-1 hour **Maximum Marks- 30**

Q 1

(a) You are given the following forecasts for the sales of the economy and conditional returns of shares X, Y and the market.

State of the economy	Conditional return			
	Probability	X	Y	Market
Recession, high interest	0.20	-13	-4	-9
Recession, low interest	0.15	16	-2	8
Boom, high interest	0.4	32	21	16
Boom, low interest	0.25	12	20	20

i. What are the ex ante betas for X and Y?
ii. If the risk free rate is 4%, calculate the ex ante alphas for stocks X and Y?
iii. Are these stocks under or overpriced?
iv. Define features line of each security

(6 + 2 + 1 + 3 = 12 Marks)

(b) Expected returns of P Ltd. and Q Ltd. are 10% and 15% respectively; while their standard deviations are 20% and 25% respectively. If the two securities have a low positive coefficient of correlation of 0.5, calculate the proportion of investment in P Ltd. and Q Ltd., which shall minimize risk.

(4 Marks)

Q 2

(a) Risk free rate of return is 9.25%. Determine required return of an equity share based on following information:

Parameter	Beta	Expected Value in %	Actual Value in %
GNP	1.20	7.70	7.70
Inflation	1.75	5.50	7.00
Interest rate	1.30	7.75	9.00
Stock Market Index	1.70	10.00	12.00
Industrial production	1.00	7.00	7.50

(4 Marks)

(Assessed answer papers shall be returned latest by 5th January, 2019)

(b) Following information is available regarding expected return, standard deviation and beta of 6 shares:

Security	Expected Return (%)	Beta	S. D. (%)
1	5	0.70	9
2	10	1.05	14
3	11	0.95	12
4	12.5	1.10	20
5	15	1.40	17.5
6	16	1.70	25

Suppose you can borrow and lend at 4%. Market return is 6% and S.D. is 10%. You are required to compute:

(i) Which security is undervalued and which is over valued

(ii) Assuming that funds are equally invested in these 6 shares, compute:

(a) Portfolio Return
(b) Portfolio Risk

(10 Marks)

(Assessed answer papers shall be returned latest by 5th January, 2019)

Solution of Test of Portfolio Management

Conducted on 22nd December, 2018

Q 1

(a) Expected Returns: X: 15.6%; Y: 12.3%; Market: 10.8%

Statistical Table:

	Security X			Security Y			Market			Cov (x,m)	Cov (y,m)	Market Variance
.20	-13	15.6	-28.6	-4	12.3	-16.3	-9	10.8	-19.8	113.26	64.55	78.41
.15	16	15.6	0.4	-2	12.3	-14.3	8	10.8	-2.8	-0.168	6.01	1.18
.40	32	15.6	16.4	21	12.3	8.7	16	10.8	5.2	34.11	18.10	10.82
.25	12	15.6	-3.6	20	12.3	7.7	20	10.8	9.2	-8.28	17.71	21.16
										138.92	106.36	111.56

(2 Marks)

(i) $\beta_x = 138.92 / 111.56 = 1.25$; $\beta_y = 106.36/111.56 = 0.95$

(4 Marks)

(ii) $E_{(r)} = 4 + 6.8\beta$.
For x: 12.5%. $\alpha = 15.6 – 12.5 = 3.1\%$
For y: 10.46%. $\alpha = 12.3 – 10.46 = 1.84\%$

(2 Marks)

(iii) Both x and y are under-priced in view of +ve alpha values.

(1 Mark)

(iv) $E_{(r)} = \alpha + \beta.R_m$
$\alpha = E_{(r)} - \beta.R_m$
For x: $\alpha = 15.6 – 1.25\ (10.8) = 2.1\%$
For y: $\alpha = 12.3 – 0.95\ (10.8) = 2.04\%$

(1 Mark)

Features Line:
For x: $E_{(r)} = 2.1 + 1.25.R_m$
For y: $E_{(r)} = 2.04 + 0.95.R_m$

(2 Marks)

(b) Cov (P, Q) = 20 (25) (.5) = 250
Weights for optimal portfolio shall be given by-
$W_P = (25)^2 – 250 / (20)^2 + (25)^2 – 2\ (250) = 0.7143$
$W_Q = 1 – 0.7143 = 0.2857$

(4 Marks)

Solution prepared by CA. Ashish Lalaji

Q 2

(a) Determination of Required Return as per APM:

Parameter	Actual Value in %	Expected Value in %	Risk Premium	Beta	Beta X Risk Premium
GNP	7.70	7.70	0	1.20	0.000
Inflation	7.00	5.50	1.50	1.75	2.625
Interest rate	9.00	7.75	1.25	1.30	1.625
Stock Market Index	12.00	10.00	2.00	1.70	3.400
Industrial production	7.50	7.00	.50	1.00	0.500
					8.15
Risk Free Return					9.25
Return as per APM					17.40

(4 Marks)

(b)

(i) Identification of undervalued / overvalued securities is carried out under CAPM.

Equation of SML is –
$Er = 4 + 2\ \beta_s$

Determination of Alpha & the nature of security:

Security	Expected Return (%)	CAPM Return (%)	Alpha (%)	Nature of security
1	5	4 + 2 (0.7) = 5.4	- 0.4	Overvalued
2	10	4 + 2 (1.05) = 6.1	3.9	Undervalued
3	11	4 + 2 (0.95) = 5.9	5.1	Undervalued
4	12.5	4 + 2 (1.10) = 6.2	6.3	Undervalued
5	15	4 + 2 (1.4) = 6.8	8.2	Undervalued
6	16	4 + 2 (1.70) = 7.4	8.6	Undervalued

(3 marks)

(ii)

(a) Determination of Portfolio Return:

Portfolio Return = 5 + 10 + 11 + 12.5 + 15 + 16 / 6 = 11.58%

(1 mark)

(b) Determination of Portfolio Risk:

Correlation coefficient between return of the securities is not given. Hence, market model is applied to determine portfolio risk.

Portfolio Beta = 0.7 + 1.05 + 0.95 + 1.1 + 1.4 + 1.7 / 6 = 1.15

Solution prepared by CA. Ashish Lalaji

Residuary variance (Unsystematic Risk) is determined as under:

Security	σ_s	σ_s^2	β_s	β_s^2	σ_m^2	Systematic Risk	Unsystematic Risk
(a)	(b)	(c)	(d)	(e)	(f)	(g) = e . f	(h) = c – g
1	9	81	0.7	0.49	100	49	32
2	14	196	1.05	1.1025	100	110.25	85.75
3	12	144	0.95	0.9025	100	90.25	53.75
4	20	400	1.1	1.21	100	121	279
5	17.5	306.25	1.4	1.96	100	196	110.25
6	25	625	1.7	2.89	100	289	336

(4 marks)

Portfolio Variance $= (1.15)^2 (100) + [(1/6)^2 (32 + 85.75 + 53.75 + 279 + 110.25 + 336)]$
$= 132.25 + 24.91$
$= 157.16$

Portfolio Risk = Square root of 157.16 = 12.54%

(2 marks)

Note: Refer class notes for formula used in the entire solution. All questions should be solved quoting the formula. Quoting right formula carries marks.

Solution prepared by CA. Ashish Lalaji