Part-1

Extra Q] HW soln. pg. 130 ..... Discussed in class

Q.65	pg
CW. 71	

CW. soln. pg. 131

Q.68	pg
CW. 72	

CW. soln. pg. 134

Q.32	pg
HW. 43	

Q.34	pg
HW. 44	

- Type 3 :- Slightly different from Type 2 sum :- weighted avg. Beta instead of simple avg Beta... No. of shares given.

Q.62	pg
CW. 69	(i)

Jump

Security	Total cost (N×P)	Total Dividend (N×D)	Total M.V. (N×M.P.)
G	10000000	1725000	9800000
S	15000000	1000000	16200000
B	14000000	700000	14100000
PSU	36000000	3600000	34500000
	75000000	7025000	74650000

$$R_P = \frac{7025000 + (74650000 - 75000000)}{75000000} \times 100 = 8.9\%$$

$$\beta_P = \frac{30000000}{75000000} = 0.4$$ Refer table below

$$8.9 = R_f + (12.7 - R_f)\,0.4$$

$$\therefore R_f = 6.37\%$$

Securities	Investment	Beta	Investment × Beta
G	10000000	0·6	6000000
S	15000000	0·8	12000000
B	14000000	0·6	8400000
PSU	36000000	0·1	3600000
	7500000		30000000

(ii) Expected Return = $R_f + [R_m - R_f]\beta$

$E[R_p] = 7 + [12.7 - 7]\,0.4 = 9.28\%$.

$\therefore R_p = 8.9\%$.

Since, Actual Return ($R_p = 8.9\%$.) < Expected Return (9.28%)

$\therefore$ underperformed.

Part-2

• Type 4 :- ([CW · Q · 60], HW · Q. 3 1])

Q·60	pg
CW· 69	

5 mutual funds with their Beta are given & we have to calculate β_p (simple average).

R_m given ... To find R_p, they have done

$R_p = \beta_p \cdot R_m$ (As R_f not given ... assumed zero)

(i) $\beta_p = \dfrac{1.6 + 1 + 0.9 + 2 + 0.6}{5} = 1.22$

(Equal weights 20 : 20 : 20 : 20 : 20)

(ii) $\beta_p = 0.15 \times 1.6 + 0.3 \times 1 + 0.15 \times 0.9 + 0.3 \times 2 + 0.1 \times 0.6$

$= 1.335$

(iii) $E(R_p)$:- Case (i) = $12 \times 1.22 = 14.64\%$.

Case (ii) = $12 \times 16.02 = 16.02\%$.

Self practice : HW · Q · 31] pg · 43

• Type 5 :- (CW·Q·58], CW·Q·63])

In this type of sum, dividend yield is taken as expected return assuming there is no capital gain yield. We are supposed to calculate β_p as weighted average .... fine .... However, they also calculated market implicit beta & compared it with β_p

β_p > market implicit beta → portfolio riskier than mkt.

Q·58	Pg
CW· 68	

(i) Calculation of β_p using weighted avg-

Stock	Mkt Value (N×P)	Beta (β)	Mkt·value × β
A	1029600	2·32	2388672
B	934400	4·56	4260864
C	868000	1·80	1562400
D	1570000	3·00	4710000
	4402000		12921936

$$\beta_p = \frac{12921936}{4402000} = 2.9355$$

Calculation of R_p -

Stocks	Investment (w)	Return	w × Return
A	1029600	9·5	97812
B	934400	14	130816
C	868000	7·5	65100
D	1570000	16	251200
	4402000		544928

$$R_p = \frac{544928}{4402000} \times 100 = 12.38\%$$

Market implicit beta :- $R_p = R_f + (R_m - R_f)\beta$

$12.38 = 10 + (20-10)\beta$

∴ mkt implicit βeta = 0.238

since $\beta_p = 2.9355 > 0.238$, portfolio is slightly riskier as compared to market.

Self practice :- [CW. Q.63] pg. 70

- Type 6 :-

Confusion blw expected return & Required return.

Q.59	pg
CW. 68	

(i) Variance is already given in the table

$\sigma_x^2 = 4.8$, $\sigma_y^2 = 4.25$, $\sigma_m^2 = 3.1$

(ii) In the portfolio, $w_x = \frac{120000}{200000} = 0.6$ & $w_y = 0.4$

$E(R_p) = 0.6 \times 15 + 0.4 \times 14 = 14.6$

$\beta_x = \frac{Cov(x, mkt)}{\sigma_{mkt}^2} = \frac{3.37}{3.10} = 1.0871$

$\beta_y = \frac{Cov(y, mkt)}{\sigma_{mkt}^2} = \frac{2.80}{3.10} = 0.9032$

$\therefore \beta_p = 0.6 \times 1.0871 + 0.4 \times 0.9032 = 1.0136$

$\sigma_p^2 = (w_x \sigma_x)^2 + (w_y \sigma_y)^2 + 2 w_x w_y Cov(x, y)$

$= (0.6)^2 \times 4.8 + (0.4)^2 \times 4.25 + 2 \times 0.6 \times 0.4 \times 4.30$

$\sigma_p^2 = 4.4720$

$\sigma_p = 2.1147$

(iii) Expected Return = $R_f + (R_m - R_f)\beta$

$E(R_x) = 10 + (12-10)\,1.0871 = 12.1742$

$E(R_y) = 10 + (12-10)\,0.9032 = 11.8064$

$E(R_p) = 10 + (12-10)\,1.0136 = 12.0272$

Systematic Risk (SR) = $\beta^2 \sigma_m^2$

$SR_x = (1.0871)^2 \times 3.1 = 3.6635$

$SR_y = (0.9032)^2 \times 3.1 = 2.5289$

$SR_p = (1.0136)^2 \times 3.1 = 3.1849$

Unsystematic Risk (UR) = TR - SR

$UR_x = 4.8 - 3.6635 = 1.1365$

$UR_y = 4.25 - 2.5289 = 1.7211$

$UR_p = 4.4720 - 3.1849 = 1.2871$

(iv) Sharpe Ratio = $\frac{E(R) - Rf}{\sigma}$

$SH_x = \frac{15 - 10}{\sqrt{4.8}} = 2.2822$

$SH_y = \frac{14 - 10}{\sqrt{4.25}} = 1.9403$

$SH_p = \frac{14.6 - 10}{2.1147} = 2.1752$

Treynor Ratio = $\frac{E(R) - Rf}{\beta}$

MFX : $\frac{15 - 10}{1.0871} = 4.5994$

MFY : $\frac{14 - 10}{0.9032} = 4.4287$

Mix : $\frac{14.6 - 10}{1.0136} = 4.5383$

Alpha = E(R) - Re

MFX = 15 - 12.1742 = 2.8258

MFY = 14 - 11.8064 = 2.1936

Mix = 14.6 - 12.0272 = 2.5728

- Type 7 :- Inflation wala sum -

CW. Q. 64] pg. 70 ≅ CW. Q. 19] pg. 51

◦ Type 8 :- $R_m < R_f$ (CW. Q.66], pg. 71)

P	x	y	Px	Py	$x-\bar{x}$	$y-\bar{y}$	$P(x-\bar{x})^2$	$P(y-\bar{y})^2$	$P(x-\bar{x})(y-\bar{y})$

Nothing wrong in this sum except that you have to make 10 columns each to calculate β of stock A & B.

R_m i.e. $\bar{x}$ = 10.2% < R_f = 11%.

Self practice : CW. Q.72] pg. 73 ... not ambiguous.