

Question – 26

Mr. Potential has made investments in two mutual funds. The following information is available:

Mutual Fund	Smart	Growth
Jensen Alpha	1.10%	1.50%
Treynor's Ratio	0.0714	0.0775
Actual Return	8.50%	9.10%
Risk Premium	4%	

You are required to calculate:

- (i) Beta (β) for both the funds
- (ii) Risk free Rate
- (iii) Security Market Line

(Exam May – 2023)

Solution:

SMART

$$\begin{aligned} \text{Alpha} &= R_p - R_e \\ 1.10 &= 8.50 - R_e \\ R_e &= 7.40 \end{aligned}$$

(1) CAPM

$$\begin{aligned} R_e &= R_f + \text{MRP } \beta \\ 7.40 &= R_f + 4 \beta \\ R_f &= 7.40 - 4 \beta \\ \text{TR} &= \frac{R_p - R_f}{\beta} \\ 0.0714 &= \frac{0.085 - [0.074 - 0.04 \beta]}{\beta} \\ 0.0714 \beta &= 0.085 - 0.074 + 0.04 \beta \end{aligned}$$

$$0.031 \beta = 0.011$$

$$\beta = \frac{0.011}{0.031} = 0.35$$

(2) Put Beta Value in CAPM Equation

$$7.40 = R_f + (4 \times 0.35)$$

$$R_f = 6\%$$

(3) SML

$$6 + 4 \beta$$

GROWTH

$$\text{Alpha} = R_p - R_e$$

$$1.50 = 9.10 - R_e$$

$$R_e = 7.60$$

(1) CAPM

$$R_e = R_f + \text{MRP} \beta$$

$$7.60 = R_f + 4 \beta$$

$$R_f = 7.60 - 4 \beta$$

$$\text{TR} = \frac{R_p - R_f}{\beta}$$

$$0.0775 = \frac{0.0910 - [0.0760 - 0.04 \beta]}{\beta}$$

$$0.0755 \beta = 0.0910 - 0.0760 + 0.04 \beta$$

$$0.0375 \beta = 0.015$$

$$\beta = \frac{0.015}{0.0375} = 0.40$$

(2) Put Beta Value in CAPM Equation

$$7.60 = R_f + (4 \times 0.40)$$

$$R_f = 6\%$$

(3) SML

$$6 + 4 \beta$$

RESIDUAL

Question – 27

On 1-4-2012 ABC Mutual Fund issued 20 lakh units at ₹ 10 per unit. Relevant initial expenses involved were ₹ 12 lakhs. It invested the fund so raised in capital market instruments to build a portfolio of ₹ 185 lakhs. During the month of April 2012 it disposed off some of the instruments costing ₹ 60 lakhs for ₹ 63 lakhs and used the proceeds in purchasing securities for ₹ 56 lakhs. Fund management expenses for the month of April 2012 was ₹ 8 lakhs of which 10% was in arrears. In April 2012 the fund earned dividends amounting to ₹ 2 lakhs and it distributed 80% of the realized earnings. On 30-4-2012 the market value of the portfolio was ₹ 198 lakhs.

Mr. Akash, an investor, subscribed to 100 units on 1-4-2012 and disposed off the same at closing NAV on 30-4-2012. What was his annual rate of earning?

(SM TYK – 16 & RTP May – 2020)

Solution:

W.N. 1: Calculation of Cash

Opening Cash (20 × 10 – 12 – 185)	3.00
(+) Investment Sold	63.00
(-) Purchase of Securities	56.00
(-) Expenses Paid (8 × 90%)	7.20
(+) Dividend Income	2.00
(-) Distribution of Income	

[2 + (63 – 60)] × 80%	4.00
Closing Cash	0.80 Lacs

Month end NAV

Closing Cash	0.80
Portfolio Value	198
Asset	198.80
(-) Outstanding Expenses	0.80
Net Asset	198.00
(÷) Units	20
NAV	9.90

Annual Rate of Earning

Beginning NAV = 10

Income per unit = $\frac{4.00}{20} = 0.20$

Closing NAV = 9.90

HRP = $\frac{(9.90 - 10) + 0.20}{10} \times 100 = 1\%$

Annualized return = $1 \times \frac{12}{1} = 12\%$ p.a.

Question – 28

On 1st april, an open ended scheme of mutual fund had 300 lakh units outstanding with Net Assets Value (NAV) of ₹ 18.75. At the end of April, it issued 6 lakh units at opening NAV plus 2% load, adjusted for dividend equalization. At the end of May, 3 Lakh units were repurchased at opening NAV less 2% exit load adjusted for dividend equalization. At the end of June, 70% of its available income was distributed.

(+) dividend equalization of April	6	0.0765	0.459
Total	306	0.0765	23.409
Income from May	306	0.1125	34.425
(-)dividend equalization for May	306	0.1890	57.834
Total	3	0.1890	(0.5670)
Income from June	303	0.1890	57.2670
Total	303	0.150	45.450
Dividend (70%)	303	0.3390	102.7170
Total	303	0.2373	(71.9019)
Income available for distribution	303	0.1017	30.8151

2. Issue price at the end of April

Opening NAV	= 18.75
(+) Entry load	= 2%
(+) dividend equalization	= 0.0765
	= 19.2015

3. Repurchased price

Opening NAV	= 18.75
(-) Exit load	= 2%
(+) dividend equalization	= 0.1890
	= 18.5640

4. NAV [300]

Opening Net asset (300 × 18.75)	= 5625
(+) Income [22.950 + 34.425 + 45.450]	= 102.825
(+) Appreciation in portfolio value	= 425.47
(+) Unit issued [6 × 19.2015]	= 115.209
(-) Units repurchased [3 × 18.5640]	= 55.692
(-) Dividend	= 71.9019

Net Asset	= 6,140.9101
÷ Units	= 303
NAV	<u>= 20.2670</u>

(6) FAMA NET SELECTIVITY MODEL

Question – 29

The returns of a portfolio A and market portfolio for the last 12 months are indicated as follows:

Month	Portfolio A	Market Portfolio
January	-0.52	0.82
February	2.20	0.04
March	2.17	2.80
April	4.17	1.72
May	2.04	0.27
June	3.00	0.39
July	1.99	1.95
August	4.00	0.64
September	-1.38	1.53
October	2.67	2.70
November	3.99	2.52
December	1.86	2.09
Standard Deviation (σ)	1.6223	0.9498

- (i) You are required to find out the monthly returns attributable to the sheer skill of the Portfolio Manager.
- (ii) What part of the monthly return is attributable to the higher risk assumed by the Portfolio Manager?

Assume that the risk-free rate of return is 12% per annum and the portfolio is fully diversified.

(Exam November – 2019)

Solution:

- (i) The monthly risk free rate of return = $(12\%/12) = 1\%$

Month	R_A	R_M
January	-0.52	0.82

February	2.20	0.04
March	2.17	2.80
April	4.17	1.72
May	2.04	0.27
June	3.00	0.39
July	1.99	1.95
August	4.00	0.64
September	-1.38	1.53
October	2.67	2.70
November	3.99	2.52
December	1.86	2.09
Average Returns	26.19	17.47
	2.1825	1.4558

Average Portfolio Return (R_p) = 2.1825

Average Portfolio Return (R_m) = 1.4558

Portfolio Risk (σ_p) = 1.6223

Market Risk (σ_m) = 0.9498

Since portfolio A is fully diversified then it can be computed with a portfolio whose beta (β) can be found as follows:

$$\sigma_m^2 \times \beta^2 = \sigma_p^2$$

$\beta = \frac{\sigma_p}{\sigma_m} = \frac{1.6223}{0.9498} = 1.708$ Therefore, portfolio A is comparable to a portfolio whose Beta is 1.708.

Expected monthly returns on such portfolio can be calculated as follows:

$$\begin{aligned} R^1_p &= R_f + \beta(R_m - R_f) \\ &= 1\% + 1.708 (1.4558\% - 1.0000\%) \\ &= 1.7785\% \end{aligned}$$

Return due to the net selectivity = $R_p - R^1_p$

$$\begin{aligned} &= 2.1825\% - 1.7785\% \\ &= 0.404\% \text{ per month} \end{aligned}$$

- (ii) The returns due to higher risk assumed by the portfolio manager
 = 1.7785% – 1.4558% = 0.3227% per month

MULTIPLE CHOICE QUESTIONS

Case Scenario 1

Mr. Y has invested in the three mutual funds (MF) as per the following details:

Particulars	MF 'X'	MF 'Y'	MF 'Z'
Amount of Investment (₹)	4,00,000	8,00,000	4,00,000
Net Assets Value (NAV) at the time of purchase (₹)	10.30	10.10	10
Dividend Received up to 31.03.2023 (₹)	9,000	0	6,000
NAV as on 31.03.2023 (₹)	10.35	10	10.30
Effective Yield per annum as on 31.03.2023 (percent)	9.66	-11.66	24.15

Assume 1 Year = 365 days

On the basis of above information, choose the most appropriate answer to the following questions:

- I.** Total NAV of MF 'Y' as on 31.03.2023 would be approximately
- (a) ₹ 401941.73
 - (b) ₹ 412000.00
 - (c) ₹ 792079.20
 - (d) ₹ 82500.00
- II.** Total Yield of MF 'X' in terms of ₹ would be approximately
- (a) ₹ 10941.73
 - (b) ₹ 7,920.80
 - (c) ₹ 18,000.00

(d) ₹ 12450.45

III. Number of days for which MF 'X' is held would be approximately.....

(a) 31 Days

(b) 68 Days

(c) 103 Days

(d) 85 Days

IV. Number of days for which MF 'Y' is held would be.....

(a) 31 Days

(b) 68 Days

(c) 103 Days

(d) 85 Days

Case Scenario 2

Mr. X on 1.7.2021, during the initial offer of some Mutual Fund invested in 10,000 units having face value of ₹ 10 for each unit. On 31/03/2022, the dividend paid by the M.F. was 10% and Mr. X found that his annualized yield was 153.33%. On 31/12/2023, 20% dividend was given. On 31/03/2024, Mr. X redeemed all his balance of 11,296.11 units when his annualized yield was 73.52%.

Based on the above information answer the following questions:

I. NAV per unit of the Fund as on 31/03/2022 shall be approximately.....

(a) ₹ 19.50

(b) ₹ 20.50

(c) ₹ 21.50

(d) ₹ 22.50

II. Total number of units as on 31/03/2022 shall be approximately.....