# Assignment – Chapter 6 – Portfolio Management

**Question 1**

Mr. FedUp wants to invest an amount of ₹ 520 lakhs and had approached his Portfolio Manager. The Portfolio Manager had advised Mr. FedUp to invest in the following manner:

| Security | Moderate | Better | Good | Very Good | Best |
|---|---|---|---|---|---|
| Amount (in ₹ Lakhs) | 60 | 80 | 100 | 120 | 160 |
| Beta | 0.5 | 1.00 | 0.80 | 1.20 | 1.50 |

You are required to advise Mr. FedUp regarding the following, using Capital Asset Pricing Methodology:

(i) Expected return on the portfolio, if the Government Securities are at 8% and the NIFTY is yielding 10%.

(ii) Advisability of replacing Security 'Better' with NIFTY.

**Question 2**

Consider the following information on two stocks, A and B:

| Year | Return on A (%) | Return on B (%) |
|---|---|---|
| 2006 | 10 | 12 |
| 2007 | 16 | 18 |

You are required to determine:

(i) The expected return on a portfolio containing A and B in the proportion of 40% and 60% respectively.

(ii) The Standard Deviation of return from each of the two stocks.

(iii) The covariance of returns from the two stocks.

(iv) Correlation coefficient between the returns of the two stocks.

(v) The risk of a portfolio containing A and B in the proportion of 40% and 60%.

**Question 3**

Mr. X owns a portfolio with the following characteristics:

| | Security A | Security B | Risk Free security |
|---|---|---|---|
| Factor 1 sensitivity | 0.80 | 1.50 | 0 |
| Factor 2 sensitivity | 0.60 | 1.20 | 0 |
| Expected Return | 15% | 20% | 10% |

It is assumed that security returns are generated by a two factor model.

(a) If Mr. X has ₹ 1,00,000 to invest and sells short ₹ 50,000 of security B and purchases ₹ 1,50,000 of security A what is the sensitivity of Mr. X's portfolio to the two factors?

(b) If Mr. X borrows ₹ 1,00,000 at the risk free rate and invests the amount he borrows along with the original amount of ₹ 1,00,000 in security A and B in the same proportion as described in part (i), what is the sensitivity of the portfolio to the two factors?

(c) What is the expected return premium of factor 2?

**Question 4**

The expected returns and Beta of three stocks are given below

| Stock | A | B | C |
|---|---|---|---|
| Expected Return (%) | 20 | 13 | 17 |
| Beta Factor | 1.9 | 0.8 | 1.4 |

If the risk-free rate is 9% and the expected rate of return on the market portfolio is 14%, examine which of the above stocks are over, under or correctly valued in the market? What shall be the strategy?

**Question 5**

Mr. X is interested in investing ₹ 4,00,000 for which he is considering following three alternatives:

(i) Invest ₹ 4,00,000 in Security A

(ii) Invest ₹ 4,00,000 in Security B

(iii) Invest ₹ 2,40,000 in Security A and ₹ 1,60,000 in Security B

Average annual return earned on Security A and Security B is 15% and 14% respectively. Risk free rate of return is 10% and Market Rate of Return is 12%.

Covariance of returns of Security A , Security B and Market portfolio are as follows:

| | Security A | Security B | Market |
|---|---|---|---|
| Security A | 4.800 | 4.300 | 3.370 |
| Security B | 4.300 | 4.250 | 2.800 |
| Market | 3.370 | 2.800 | 3.100 |

On the basis of above information evaluate the following:

(i) Expected Return of Security A, B and Portfolio.

(ii) Variance of return of Security A, Security B and Market.

(iii) Variance and Standard Deviation of Portfolio.

(iv) Systematic and Unsystematic Risks of Security A, Security B and Portfolio

**Question 6**

Suppose that economy A is growing rapidly, and you are managing a global equity fund and so far you have invested only in developed- country stocks only. Now you have decided to add stocks of economy A to your portfolio. The table below shows the expected rates of return, standard deviations, and correlation coefficients (all estimates are for aggregate stock market of developed countries and stock market of Economy A).

| | Developed Country Stocks | Stocks of Economy A |
|---|---|---|
| Expected rate of return (annualized percentage) | 20 | 30 |
| Risk [Annualized Standard Deviation (%)] | 16 | 30 |
| Correlation Coefficient (□) between stock of two economies | 0.30 | |

Assuming the risk-free interest rate to be 6%, you are required to determine:

(a) What percentage of your portfolio should you allocate to stocks of Economy A if you want to increase the expected rate of return on your portfolio by 1%?

(b) What will be the standard deviation of your portfolio assuming that stocks of Economy A are included in the portfolio as calculated above?

(c) Also show how well the Fund will be compensated for the risk undertaken due to inclusion of stocks of Economy A in the portfolio?

**Question 7**

An investor has two portfolios known to be on minimum variance set for a population of three securities X, Y and Z having below mentioned weights:

| | **WX** | **WY** | **WZ** |
|---|---|---|---|
| Portfolio A | 0.30 | 0.40 | 0.30 |
| Portfolio B | 0.20 | 0.50 | 0.30 |

Calculate the weight for each stock for a portfolio constructed by investing ₹ 10,00,000 in portfolio A and ₹ 6,00,000 in portfolio B.

**Question 8**

Following are the details of a portfolio consisting of three shares:

| **Share** | **Portfolio weight** | **Beta** | **Expected return in %** | **Total variance** |
|---|---|---|---|---|
| A | 0.20 | 0.40 | 14 | 0.015 |
| B | 0.50 | 0.50 | 15 | 0.025 |
| C | 0.30 | 1.10 | 21 | 0.100 |

Standard Deviation of Market Portfolio Returns = 10% You are given the following additional data:

Covariance (A, B) = 0.030

Covariance (A, C) = 0.020

Covariance (B, C) = 0.040

Calculate the following:

(i) The Portfolio Beta

(ii) Residual variance of each of the three shares

(iii) Portfolio variance using Sharpe Index Model

(iv) Portfolio variance (on the basis of modern portfolio theory given by Markowitz)