

Question Paper

Portfolio Management and Mutual Funds - I (MSF2D3) : October 2007

Section A : Basic Concepts (30 Marks)

- This section consists of questions with serial number 1 - 30.
- Answer all questions.
- Each question carries one mark.
- Maximum time for answering Section A is 30 Minutes.

1. Which of the following statements is/are said to be **true** with respect to risk penalty? [< Answer >](#)

- Higher the risk penalty, lower the utility of the return for the investor.
 - The risk penalty will be lower for smaller values of risk tolerance and higher values of variance of asset mix.
 - For risk loving investors, risk tolerance is high and risk penalty is low resulting in high utility.
- Only (I) above
 - Only (III) above
 - Both (I) and (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above.

2. Consider the following two portfolios with their respective risk and return characteristics: [< Answer >](#)

Portfolio	Expected Return (%)	Standard deviation (%)
P	20	25
Q	30	15

Based on the above information, assuming that Capital Asset Pricing Model (CAPM) holds good, is it possible that both portfolios P and Q exist simultaneously?

- Impossible, since standard deviation of portfolio P is more than that of Q, return from portfolio P should also be more
- Possible, since there is an inverse relationship between risk and return
- Impossible, since CAPM assumes that all the portfolios give the same return irrespective of their risks
- Possible, if beta of portfolio Q is more than that of P, the expected return from Q can be more than that of P even though standard deviation of P is more than that of Q
- Insufficient information.

3. Which of the following is/are **true** with respect to variable ratio plan? [< Answer >](#)

- The ratio will increase when there is an increase in the value of the portfolio.
 - The ratio will increase when there is a decrease in the value of the aggressive portfolio.
 - The aggressive portfolio becomes more aggressive when the stock price rises and less aggressive when the stock price falls.
- Only (I) above
 - Only (II) above
 - Both (I) and (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above.

4. Which of the following statements is/are **false** with respect to yield enhancement strategy of portfolio using index futures? [< Answer >](#)

- Yield enhancement strategy refers to portfolio strategy of holding a synthetic stock index fund.
 - In this strategy, in the absence of yield enhancement, synthetic securities can not be useful for hedging a portfolio position which is quite difficult to hedge in the cash market either because of lack of liquidity or some imposed constraints.
 - Yield enhancement strategy provides better return on a portfolio by exploiting the mispricing of the futures.
- Only (I) above
 - Only (II) above
 - Both (I) and (II) above
 - Both (I) and (III) above
 - Both (II) and (III) above.

5. Which of the following statements is/are **false** with respect to the conditions required to assure multiple liability [< Answer >](#)

immunization in the case of parallel shifts?

- I. The present value of the liabilities should be equal to the present value of the assets.
 - II. The duration of the assets should be equal to the duration of the liabilities.
 - III. The convexity of assets in the portfolio should be less than the convexity of the liabilities.
- (a) Only (I) above
 - (b) Only (III) above
 - (c) Both (I) and (II) above
 - (d) Both (I) and (III) above
 - (e) Both (II) and (III) above.

6. If the market is providing a return of 15% and Treasury bills are yielding 7%, according to CAPM, which of the following securities is/are overvalued?

[< Answer >](#)

Security	β_i	Expected return (%)
P	1.4	18.2
Q	1.1	22.8
R	1.7	19.4
S	1.2	19.4

- (a) Security Q
- (b) Security R
- (c) Security S
- (d) Both securities P and Q
- (e) Both securities R and S.

7. An active portfolio manager defines his normal portfolio because

[< Answer >](#)

- (a) He wants to out perform the market
- (b) He wants to generate a return which is at least equal to market return
- (c) He uses this portfolio as a benchmark for comparison of his performance
- (d) He has statutory obligation to do so
- (e) He has to gain the confidence of investors.

8. The following is the information pertaining to a portfolio:

[< Answer >](#)

Return on the portfolio	13.72%
S.D of the portfolio returns	19.63%
Return on the market index	11.26%
S.D. of the market index returns	14.35%
Return on Treasury Bills	7%

The return from net selectivity of the portfolio is approximately

- (a) - 0.42%
- (b) + 0.42%
- (c) - 0.89%
- (d) + 0.89%
- (e) + 1.21%.

9. Consider a bullish spread option strategy using a call option on the stock of Essar Oil with Rs.55 exercise price priced at Rs.6 and a call option with Rs.70 exercise price priced at Rs.3.5. The current market price of stock of Essar Oil is Rs.62. If the price of the stock is Rs.90 on maturity, the net profit at expiration is

[< Answer >](#)

- (a) Re. 1.50
- (b) Rs.10.50
- (c) Rs.12.50
- (d) Rs.35.00
- (e) Rs.60.00.

10. You are managing a portfolio of Rs.5 million. Your target duration is 8 years and you can choose from two bonds: a zero-coupon bond with a maturity of 6 years and a perpetual bond, each currently yielding 8%. The proportions of investments to be made in each bond respectively to achieve target duration are

[< Answer >](#)

- (a) 0.57 and 0.43
- (b) 0.69 and 0.31
- (c) 0.73 and 0.27
- (d) 0.86 and 0.14
- (e) 0.91 and 0.09.

11. The following two types of securities are available in the market for investment.

[< Answer >](#)

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Security	Return (%)	Standard deviation (%)
Gilt-edged security	7	0
Equity	25	30

Using the above two securities, if you are planning to invest Rs.20,00,000 to construct a portfolio with a standard deviation of 24%, the return on such portfolio is

- (a) Rs.2,18,000
- (b) Rs.2,75,000
- (c) Rs.3,12,000
- (d) Rs.3,96,000
- (e) Rs.4,28,000.

12. The Sharpe ratio and Treynor ratio of a scheme of Kotak Fund are 0.72 and 8.13 respectively. The risk premium generated by the scheme is 7%. The standard deviation of the market index's return is 10.12%. Coefficient of determination of the returns of the scheme approximately is

[< Answer >](#)

- (a) 0.58
- (b) 0.64
- (c) 0.72
- (d) 0.80
- (e) 0.92.

13. The following is the information pertaining to an open-ended mutual fund scheme.

[< Answer >](#)

Particulars	Rs. in million
Value of investments	380.0
Receivables	16.4
Accrued income	6.5
Other current assets	53.6
Liabilities	48.5
Accrued expenses	12.4

If the number of outstanding units is 188 lakh and the public offer price is Rs.21.309, the entry load charged by the fund is approximately

- (a) 1.00%
- (b) 1.25%
- (c) 1.75%
- (d) 2.15%
- (e) 2.50%.

14. The risk, which relates to errors in the execution of transactions, delays in settlement and losses due to counter party default can be called

[< Answer >](#)

- (a) Organizational risk
- (b) Portfolio selection risk
- (c) Management process risk
- (d) Securities related risk
- (e) Business risk.

15. Preference of a sure gain to an uncertain event with the same expected value as that of a sure outcome, is referred to as

[< Answer >](#)

- (a) Asset aversion
- (b) Loss aversion
- (c) Risk aversion
- (d) Liability aversion
- (e) Emotional constraint.

16. Two factors, growth rate of industrial production and inflation rate, have been identified for Indian economy to determine the expected rate of return on a stock. When the annual growth rate of industrial production is expected to be 11.6% p.a. and annual inflation rate 5.6%, the stock with betas of 0.36 on growth rate of industrial production and 1.44 on inflation rate currently is expected to provide a rate of return of 18% p.a. If industrial production actually grows by 10.4% p.a., while inflation rate turns out to be 6.5% p.a., as per the revised estimate the expected rate of return on the stock should be

[< Answer >](#)

- (a) More by 0.638%
- (b) Less by 0.864%
- (c) Less by 0.638%
- (d) More by 0.864%
- (e) More by 0.448%.

17. The current price of Sonata Software's stock is Rs.62 and it is expected that price of the stock may either go up to Rs.70.06 or go down to Rs.52.70. If strike price of call option on the stock is Rs.62 and risk-free rate is 7% p.a., the probability of decrease in stock price is [< Answer >](#)
- 0.4523
 - 0.3971
 - 0.2143
 - 0.1126
 - 0.0951.
18. In equity portfolio management, active managers are first hired to add value. However, this creates 'holes' – where lack of equity market coverage exists. The passive fund which is created to fill in these holes is called [< Answer >](#)
- Customized fund
 - Factor fund
 - Style fund
 - Completeness fund
 - Arbitrage fund.
19. The standard deviation of returns of a portfolio of two stocks will be the weighted average of the standard deviation of the returns of stocks, if the coefficient of correlation between the returns of two stocks is [< Answer >](#)
- 0
 - 1
 - + 1
 - + 0.5
 - 0.5.
20. Which of the following is **true** with respect to formula plans in portfolio revision techniques? [< Answer >](#)
- They offer no suggestions to select securities
 - They are flexible
 - They do not appear mechanical
 - They really eliminate the need for projections regarding the movement of asset prices
 - They are suitable for too short period as well as for too long period.
21. Which of the following is **not true** with respect to yield spread analysis? [< Answer >](#)
- Yield spread analysis assumes that there exists abnormal relationship between the yields for bonds in alternative sectors
 - Yield spread is affected by yield volatility and the behavior of embedded options
 - The effect of yield volatility on the business cycle influences yield spread
 - The spread seems to increase during periods of recession and decreases during periods of expansion
 - Yield volatility and transaction liquidity affect yield spread.
22. Which of the following is **not true** with respect to different asset allocation strategies? [< Answer >](#)
- Tactical asset allocation takes into consideration the changes in expected return, risks as well as correlations
 - In strategic asset allocation, when each asset mix is expressed in terms of the percentage of the total amount invested in each asset class, it is termed as constant asset mix strategy
 - Strategic asset allocation indicates an optimal asset mix to be held under normal conditions
 - Tactical asset allocation considers the possibility of investor's risk-tolerance
 - Insured asset allocation is aimed at achieving the objectives of the investor without depending on market timing.
23. Which of the following is **not** the bond index enhancement strategies that help in offsetting the proportion of tracking error that would come from expenses and transaction? [< Answer >](#)
- Lower cost enhancement
 - Currency selection enhancement
 - Yield curve enhancement
 - Sector enhancement
 - Call exposure enhancement.
24. Which of the following is/are the assumptions of classical decision-making theory? [< Answer >](#)
- Asset comparison.
 - Risk aversion.
 - Irrational exuberance.
- Only (I) above
 - Only (II) above
 - Both (I) and (II) above

- (d) Both (I) and (III) above
- (e) Both (II) and (III) above.

25. Which of the following is **not** an advantage of mutual fund?

[< Answer >](#)

- (a) Diversification benefits
- (b) Low transaction costs
- (c) Availability of various schemes to suit different needs
- (d) Professional management
- (e) Selection of stocks as per the liking of the investors.

26. Which of the following statements is/are **true** with respect to “unsystematic risk”?

[< Answer >](#)

- I. It is the uncertainty in the return that arises from events that are specific to the firm.
- II. It is manifested as a tendency of related assets to move together in a way that is independent of the market as a whole.
- III. It is the uncertainty in the return that affects the entire market.

- (a) Only (I) above
- (b) Only (II) above
- (c) Only (III) above
- (d) Both (I) and (II) above
- (e) Both (II) and (III) above.

27. Which of the following is/are features of an index futures contract?

[< Answer >](#)

- I. Index futures are settled by exchange of stocks and cash through stock exchange.
- II. Index futures are traded in the stock exchange and performance of all index futures are guaranteed by the exchange’s clearing corporation.
- III. Index futures are leveraged instruments requiring only margin.

- (a) Only (I) above
- (b) Only (II) above
- (c) Both (I) and (II) above
- (d) Both (I) and (III) above
- (e) Both (II) and (III) above.

28. Which of the following portfolio evaluation measures depends upon the capital market line?

[< Answer >](#)

- (a) Sharpe ratio
- (b) Treynor ratio
- (c) Return from total selectivity
- (d) Return due to net selectivity
- (e) Reward to variability ratio.

29. Which of the following is/are assumptions common to both Markowitz model and CAPM?

[< Answer >](#)

- I. Investors can borrow and lend at risk free rate.
- II. Investors have homogenous expectations regarding mean, variance and covariances of returns.
- III. There are no market imperfections.
- IV. Investors choose portfolios on the basis of expected returns and variance of returns.

- (a) Only (IV) above
- (b) Both (I) and (III) above
- (c) Both (I) and (IV) above
- (d) Both (III) and (IV) above
- (e) All (I), (II), (III) and (IV) above.

30. An investor takes as large position as possible, when an equilibrium price relationship is violated. This is an example of

[< Answer >](#)

- (a) A dominance argument
- (b) The mean-variance efficient frontier
- (c) A risk-free arbitrage
- (d) The capital asset pricing model
- (e) The speculation argument.

END OF SECTION A

Section B : Problems (50 Marks)

- This section consists of questions with serial number 1 – 5.
- Answer **all** questions.
- Marks are indicated against each question.
- Detailed workings should form part of your answer.
- Do not spend more than 110 - 120 minutes on Section B.

1. A fund manager is considering three mutual funds – an equity fund, a bond fund and a money market fund. The information pertaining to these funds is as follows:

[< Answer >](#)

Fund	Expected return (%)	Standard Deviation (%)
Equity Fund	18	29
Bond Fund	11	14
Money Market Fund	7	0

The coefficient of correlation between the returns on two risky funds is 0.05.

You are **required** to calculate

- The proportion of funds to be invested in two risky funds so as to form a minimum variance portfolio.
- The expected return and the standard deviation of returns of the minimum-variance portfolio.
- The portfolio proportions and the resulting standard deviations for a portfolio of risky funds, if the expected return on the portfolio is 22%.

(3 + 3 + 4 = 10 marks)

2. Mr. Sailesh has zeroed in on the following stocks with the parameters given below:

[< Answer >](#)

Stock	Expected Return (%)	Systematic Risk (%) ²	Residual Variance (%) ²
Arvind Mills	14.90	22.5625	9.25
Bajaj Auto	14.39	23.5225	5.95
Cipla	17.45	39.0625	9.75
Dena Bank	15.95	27.5625	5.35
Essar Oil	16.15	30.2500	4.50

The market is generating a return of 14% p.a. and the variance of its returns is 25(%)². The Treasury Bills are yielding 7% p.a.

You are **required** to construct an optimum portfolio using the Sharpe's optimization method.

(10 marks)

3. Mr. Harsha, an investor is trying to analyze the performance of four fund managers. You are an analyst whom he approaches for advice. The relevant data about the funds is given as under:

[< Answer >](#)

Fund	Return (%)	Unsystematic risk (%) ²	Coefficient of Correlation between fund and market returns
Reliance Equity Fund	16.75	21	0.95
HDFC Equity Fund	21.63	18	0.97
Alliance Equity Fund	16.45	16	0.92
Franklin Templeton Equity Fund	14.25	17	0.93
Market	22.00	–	–

The variance on the returns from the market portfolio is 361(%)². The risk free rate of return is 7%.

For the above funds, you are **required** to compute

- Sharpe Ratio.
- Treynor Ratio.
- Return from total selectivity, net selectivity and inadequate diversification and also analyze which of the above fund managers have exhibited superior selection skills.

(4 + 4 + 6 = 14 marks)

4. Pension plan of ICICI Prudential states that a client, Mr. Hitesh, will receive Rs.15,000 a year for a 12 year period. The first payment is likely to be received by him at the end of 5th year. Mr. Pratyush who is managing the pension plan wants to immunize this liability by investing in 4 year and 13 year zero coupon bonds selling in the denomination of Rs.1,000 each. If the current interest rate is 11.5% per annum, you are **required** to calculate the amount of money to be invested in each of the zero coupon bonds.

[< Answer >](#)**(8 marks)**

5. The settlement price of a Nifty futures contract, on a particular day in a particular month of the year 2007 on NSE was 4144.2. The multiple associated with the contract is 50.

[< Answer >](#)

The initial margin for the contract is Rs.15,000 and the maintenance margin is set at Rs.10,000. The settlement prices on subsequent eight days were as follows:

Day	Settlement price
1	3984.20
2	4214.85
3	4290.00
4	4153.85
5	3877.30
6	4071.50
7	4115.50
8	4222.00

You are **required** to calculate the mark-to-market cash flows, the daily closing balances and net profit (or loss) in the account of an investor who has gone:

- Long at 4144.2
- Short at 4144.2.

(4 + 4 = 8 marks)

END OF SECTION B

Section C : Applied Theory (20 Marks)

- | |
|---|
| <ul style="list-style-type: none"> This section consists of questions with serial number 6 - 7. Answer all questions. Marks are indicated against each question. Do not spend more than 25 -30 minutes on section C. |
|---|

6. If one wants to save to build capital for his or her retirement, he/she might want to limit his/her analysis to long-term bond funds in the hope of earning the relatively higher returns from such investment. Explain the factors that an investor should keep in mind while selecting a bond fund.

[< Answer >](#)**(10 marks)**

7. There are many reasons to justify the changes in the portfolio of the clients. The portfolio manager becomes alert and sensitive to the changes in the requirements of the client. Discuss the important factors affecting the client that make it necessary to change the portfolio composition.

[< Answer >](#)**(10 marks)**

END OF SECTION C

END OF QUESTION PAPER

Suggested Answers

Portfolio Management and Mutual Funds - I (MSF2D3): October 2007

Section A: Basic Concepts

1. Answer : (d)
- Reason : The risk penalty is higher for smaller values of risk tolerance and higher values of variance of asset mix. Hence option (II) is false and option (I) and (III) are correct. Hence option (d) is the correct answer.

[< TOP >](#)

2. Answer : (d)

[< TOP >](#)

Reason : Possible. If the CAPM is valid, the expected rate of return compensates only for systematic (market) risk represented by beta rather than for the standard deviation, which includes nonsystematic risk also. Thus, P's lower rate of return can be paired with a higher standard deviation, as long as P's beta is lower than Q's.

3. Answer: (b)

[< TOP >](#)

Reason: In a variable ratio plan the ratio of the aggressive portfolio to the conservative portfolio changes in the value of the aggressive portfolio. The ratio will decrease when there is an increase in the value of the portfolio and will increase when there is a decrease in the value of the portfolio. The aggressive portfolio will become more aggressive when the stock price falls and less aggressive when the stock price rises.

4. Answer : (b)

[< TOP >](#)

Reason : Yield enhancement strategy refers to portfolio strategy of holding a synthetic stock index fund. In this strategy, even in the absence of yield enhancement, synthetic securities can be useful for hedging a portfolio position which is quite difficult to hedge in the cash market either because of lack of liquidity or some imposed constraints.

Yield enhancement strategy provides better return on a portfolio by exploiting the mispricing of the futures.

5. Answer: (b)

[< TOP >](#)

Reason: The main conditions that are necessary to assure multiple liability immunization in case of parallel shift are:

- The present value of the liabilities should be equal to the present value of the assets.
- The duration of the assets should be equal to the duration of the liabilities.
- The convexity of assets in the portfolio should be greater than the convexity of the liabilities.

Hence option (b) is the correct answer.

6. Answer : (b)

[< TOP >](#)

Reason : The required return on a security is given by $R_i = R_f + \beta_i (R_m - R_f)$. Substituting the corresponding values,

Required Return on Security P = $7 + 1.4 (15 - 7) = 18.2\%$

Required Return on Security Q = $7 + 1.1 (15 - 7) = 15.8\%$

Required Return on Security R = $7 + 1.7 (15 - 7) = 20.6\%$

Required Return on Security S = $7 + 1.2 (15 - 7) = 16.6\%$

By comparing required return with expected returns, we can say that Security R is overvalued.

7. Answer : (c)

[< TOP >](#)

Reason : A normal portfolio defines the world in which the manager operates and the standard against which he is attempting to add value. Active managers define their normal portfolio to use them as benchmark for comparison of their performance. Hence, (c) is the answer. There is no statutory obligation to do so and by choosing normal portfolio he does not want to either out perform the market or earn a return at least equal to the market. Selection of a normal portfolio does not increase the confidence of the investor. Therefore, (a), (b), (d) and (e) are not correct.

8. Answer : (d)

[< TOP >](#)

Reason : Return from net selectivity

=

= $13.72 -$

= 0.89% .

9. Answer : (c)

[< TOP >](#)

Reason : A bullish vertical spread with calls will involve buying an in-the-money call and selling an out-of-the-money call of the same term to expiration.

Buy a call option with exercise price of Rs.55 @ Rs.6.00

Sell a call option with exercise price of Rs.70 @ Rs.3.50

Initial outlay Rs.2.50

If stock price on expiration increases to Rs.90,

Profit from buying call option = $Rs.90 - Rs.55 = Rs.35$

Loss on selling call option = $Rs.90 - Rs.70 = Rs.20$

Net payoff after considering initial outlay = $35 - 20 - 2.50 = \text{Rs.}12.50$.

10. Answer : (c)

[< TOP >](#)

Reason : The duration of the perpetuity is $[(1+YTM)/YTM] = 1.08/0.08 = 13.5$ years.

Let w be the weight of the zero-coupon bond. Then we can find w by solving the following equation:

$$W \times 6 + (1 - W) \times 13.5 = 8$$

$$6W + 13.5 - 13.5W = 8$$

$$W = 0.73$$

Therefore, your portfolio would be 0.73 or 73% invested in the zero coupon bond and 0.27 or 27% in the perpetuity.

11. Answer : (e)

[< TOP >](#)

Reason : $\sigma_p^2 = W_f^2 \sigma^2 + W_r^2 \sigma^2 + 2 W_f W_r \sigma_f \sigma_r \rho_{rf}$

Since, standard deviation of Gilt-edged securities is 0 and its' correlation with the equity is also 0, the above formula will be reduced to

$$\sigma_p^2 = W_r^2 \sigma^2$$

$$\sigma_p = W_r \sigma$$

$$24\% = 30\% W_r$$

$$W_r = 24\%/30\% = 0.80$$

$$R_p = W_f R_f + W_r R_r = 0.2 \times 7\% + 0.8 \times 25\% = 21.4\%$$

$$\text{Return (in rupees)} = 21.4\% \times 20,00,000 = \text{Rs.}4,28,000.$$

12. Answer : (d)

[< TOP >](#)

Reason : $\rho_{AB} = \frac{\text{Cov}(A, B)}{\sigma_A \sigma_B} = \frac{0.0001}{0.0001} = 1$

$$= \frac{0.0001}{0.0001} = 1 = 11.29\%$$

$$r = 0.896368$$

$$\text{Coefficient of determination} = 0.803476 \sim 0.8.$$

13. Answer : (b)

[< TOP >](#)

Reason : NAV of the fund unit = $\frac{\text{Rs.}21.309}{1.0125} = 21.0426$

The public offer price (POP) = $21.0426 \times 1.0125 = \text{Rs.}21.309$

X = 1.25%.

14. Answer : (c)

[< TOP >](#)

Reason: The risk, which relates to errors in the execution of transactions, delays in settlement and losses due to counter party default can be called management process risk.

15. Answer : (c)

[< TOP >](#)

Reason: Preference of a sure gain to an uncertain event with the same expected value as that of a sure outcome, is referred to as risk aversion.

16. Answer : (d)

[< TOP >](#)

Reason : $R_i = \alpha + \beta_1 IIP_g + \beta_2 I$

$$18 = \alpha + 0.36 \times 11.6 + 1.44 \times 5.60$$

$$\alpha = 18 - 12.24 = 5.76\%$$

The revised estimate of the expected rate of return of the stock =

$$5.76 + 0.36 \times 10.4 + 1.44 \times 6.5 = 18.864$$

As per the revised estimate, return on the stock should be more by $(18.864 - 18) 0.864\%$.

17. Answer : (c)

[< TOP >](#)

Reason:

Probability of price increase =

=

Probability of price decrease = $1 - 0.7857 = 0.2143$.

18. Answer : (d)

[< TOP >](#)

Reason : The passive strategy to fill in these holes completes the desired coverage and hence it is called

completeness fund.

19. Answer : (c) [< TOP >](#)
Reason : If coefficient of correlation between two stock's return A and B is +1 and W_A and W_B is the amount invested in a portfolio of these two stocks. Portfolio risk will be
Hence answer is (c).
20. Answer : (a) [< TOP >](#)
Reason : Formula plans offer no suggestions to select securities. They are very rigid and not suitable for too short a period or too long a period. They appear mechanical, but do not really eliminate the need for projections regarding the movement of asset prices. Hence, alternative (a) is answer.
21. Answer : (a) [< TOP >](#)
Reason : Yield spread analysis assumes that there exists normal relationship between the yields for bonds in alternative sectors. The spread is seen to increase during periods of recession and decreases during periods of expansion. There are three ways by which spreads will be affected.
a. Yield volatility and the behavior of embedded options
b. The effect of yield volatility on the business cycle
c. Yield volatility and transaction liquidity
Hence, alternative (a) is answer.
22. Answer : (d) [< TOP >](#)
Reason : Tactical asset allocation takes into consideration the changes in expected return, risks as well as correlations, but it does not consider the possibility of investor's risk-tolerance. In strategic asset allocation, when each asset mix is expressed in terms of the percentage of the total amount invested in each asset class, it is termed as constant asset mix strategy. Strategic asset allocation indicates an optimal asset mix to be held under normal conditions. Insured asset allocation is aimed at achieving the objectives of the investor without depending on market timing. Hence, alternative (d) is answer.
23. Answer : (b) [< TOP >](#)
Reason : Various indexing strategies help in offsetting the proportion of tracking error that would come from expenses and transaction costs. These enhancement strategies can be lower cost, issue selection, yield curve positioning, sector and quality positioning and call exposure positioning.
24. Answer : (c) [< TOP >](#)
Reason : Classical decision-making theory revolves around three assumptions: asset integration (comparison), risk aversion, and rational expectation. Hence, alternative (c) is answer.
25. Answer : (e) [< TOP >](#)
Reason : All the alternatives a, b, c and d are the advantages of a mutual fund. Alternative e) is not an advantage as the fund managers though try to have holdings in the flavours of the season however stock selection as per the living of all the investors is not possible.
26. Answer : (d) [< TOP >](#)
Reason : Statement III relates to entire market hence is implying systematic risk.
27. Answer : (e) [< TOP >](#)
Reason : Statement I is not correct as Index futures contracts are necessarily cash settled.
28. Answer : (d) [< TOP >](#)
Reason : Sharpe's measure & Treynor's measure are not based on CML. Return from total selectivity depends upon SML. Whereas return from net selectivity use CML.
29. Answer : (a) [< TOP >](#)
Reason : Statements I, II and III are assumptions specific to CAPM only. Only statement IV is a common assumption to both.
30. Answer : (c) [< TOP >](#)
Reason : An investor takes as large a position as possible, when an equilibrium price relationship is violated. This is an example of a risk-free arbitrage.

Section B : Problems

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1. a. For constructing a minimum variance portfolio, the condition to be satisfied is $W_1 =$, where W_1 denotes the proportion of funds to be invested in asset 1.

Let W_1 denote the proportion of investment in equity fund. In order to have a minimum risk portfolio,

$$W_1 = \frac{29 \times 14 \times 0.05}{29^2 + 14^2 + 2 \times 29 \times 14 \times 0.05} = 0.1763$$

$$W_2 = 1 - 0.1763 = 0.8237$$

- b. The expected value of the minimum variance portfolio =
Substituting the given values, we get

$$E_p = 0.1763 \times 18 + 0.8237 \times 11 = 0.1223 \approx 12.23\%$$

The standard deviation on the portfolio consisting of two assets is given by

$$\sigma_p = \sqrt{(0.1763)^2 \times (29)^2 + (0.8237)^2 \times (14)^2 + 2 \times 0.1763 \times 0.8237 \times 29 \times 14 \times 0.05}$$

Substituting the given values, we get

$$\sigma_p = ((0.1763)^2 \times (29)^2 + (0.8237)^2 \times (14)^2 + 2 \times 0.1763 \times 0.8237 \times 29 \times 14 \times 0.05)^{1/2} = 12.85\%$$

- c. If the expected return on the portfolio is 24%, the proportions of funds invested in the two risky funds can be determined as follows:

Let the investment in equity fund be W_1 . So the investment in Bond fund will be $(1 - W_1)$

$$E_p = W_1 \times 18 + (1 - W_1) \times 11 = 22$$

$W_1 = 1.57$ and $W_2 = -0.57$ i.e. the fund manager should borrow and invest in equity fund and go short on the bond fund.

The resulting standard deviation will be

$$\sigma_p = (1.57^2 \times 29^2 + (-0.57)^2 \times 14^2 + 2 \times 1.57 \times (-0.57) \times 29 \times 14 \times 0.05)^{1/2} = 45.83\%$$

2. Systematic Risk = $\beta^2 \times \text{Market Variance} =$

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$$\beta = [\text{Systematic Risk} / \text{Market Variance}]^{1/2}$$

$$\beta_A = (22.5625/25)^{1/2} = 0.95$$

$$\beta_B = (23.5225/25)^{1/2} = 0.97$$

$$\beta_C = (39.0625/25)^{1/2} = 1.25$$

$$\beta_D = (27.5625/25)^{1/2} = 1.05$$

$$\beta_E = (30.25/25)^{1/2} = 1.10$$

Stock	β_i	R_i	$R_i - R_f$	$(R_i - R_f) / \beta_i$	Rank
Arvind Mills	0.95	14.90	9.25	7.90	4
Bajaj Auto	0.97	14.39	5.95	7.39	5
Cipla	1.25	17.45	9.75	10.45	2
Dena Bank	1.05	15.95	5.35	8.95	1
Essar Oil	1.10	16.15	4.50	9.15	3

Rank	Stock	σ^2_{ei}	β_i	$R_i - R_f$	$(R_i - R_f) \times \beta_i$	$(R_i - R_f) \beta_i / \sigma^2_{ei}$
1	Dena Bank	5.35	1.05	8.95	9.3975	1.7565
2	Cipla	9.75	1.25	10.45	13.0625	1.3407
3	Essar Oil	4.50	1.10	9.15	10.0650	2.2367
4	Arvind Mills	9.25	0.95	7.90	7.5050	0.8114
5	Bajaj Auto	5.95	0.97	7.39	7.1683	1.2048

Stock			Σ	Σ	

Dena Bank	1.7565	0.2061	1.7565	0.2061	7.1373
Cipla	1.340	0.1603	3.0965	0.3664	7.6193
Essar Oils	2.2367	0.2689	5.3332	0.6353	7.8975
Arvind Mills	0.8114	0.0976	6.1446	0.7329	7.9501
Bajaj Auto	1.2048	0.1581	7.3494	0.8910	7.8941

$$C^* = 7.9501$$

$$Z_i = \frac{R_i - R_f}{\sigma_i}$$

$$Z_D = \frac{7.8941 - 7.9501}{0.0376} = 0.1126$$

$$Z_C = \frac{7.6193 - 7.9501}{0.0376} = 0.0526$$

$$Z_E = \frac{7.8975 - 7.9501}{0.0376} = 0.0899$$

$$Z_A = \frac{7.1373 - 7.9501}{0.0376} = 0.0376$$

$$Z_i = 0.1126 + 0.0526 + 0.0899 + 0.0376 = 0.2927$$

$$\%D = \frac{0.1126}{0.2927} = 0.3847 \text{ i.e. } 38.47\%$$

$$\%C = \frac{0.0526}{0.2927} = 0.1797 \text{ i.e., } 17.97\%$$

$$\%E = \frac{0.0899}{0.2927} = 0.3071 \text{ i.e., } 30.71\%$$

$$\%A = \frac{0.0376}{0.2927} = 0.1285 \text{ i.e., } 12.85\%$$

3. a.

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Fund	$R_i(\%)$	$(\%)^2$	Coefficient of determination	Variance $(\%)^2$	SD (%)
Reliance Equity Fund (A)	16.75	21.00	0.9025	$21/(1-0.9025) = 215.3846$	14.68
HDFC Equity Fund (B)	21.63	18.00	0.9409	$18/(1-0.9409) = 304.5685$	17.45
Alliance Equity Fund (C)	16.45	16.00	0.8464	$16/(1-0.8464) = 104.1667$	10.21
Franklin Templeton Equity Fund (D)	14.25	17.00	0.8649	$17/(1-0.8649) = 125.8327$	11.22

Sharpe Ratio	
Fund	$(R_i - R_f) / \sigma_i$
A	$(16.75 - 7) / 14.68 = 0.6642$
B	$(21.63 - 7) / 17.45 = 0.8384$
C	$(16.45 - 7) / 10.21 = 0.9256$
D	$(14.25 - 7) / 11.22 = 0.6462$

b.

Fund	$(\text{Variance} - \text{Systematic risk}) =$	Beta = $(\text{Systematic Risk} / \text{Market Risk})^{1/2}$
Reliance Equity Fund (A)	194.3846	$(194.3846/361)^{(1/2)} = 0.73$
HDFC Equity Fund (B)	286.5685	$(286.5685/361)^{(1/2)} = 0.89$
Alliance Equity Fund (C)	88.1667	$(88.1667/361)^{(1/2)} = 0.49$
Franklin Templeton Equity Fund (D)	108.8327	$(108.8327/361)^{(1/2)} = 0.55$

Treynor Ratio	
Fund	$(R_i - R_f) / \beta_i$
A	$(16.75 - 7) / 0.73 = 13.36$
B	$(21.63 - 7) / 0.89 = 16.44$
C	$(16.45 - 7) / 0.49 = 19.29$
D	$(14.25 - 7) / 0.55 = 13.18$

c.

Fund	$R_i (\%)$	$R_f + \beta_i (R_m - R_f)$	Return due to total selectivity (%)
A	16.75	$7 + 0.73 \times 15 = 17.95$	-1.20
B	21.63	$7 + 0.89 \times 15 = 20.35$	1.28
C	16.45	$7 + 0.49 \times 15 = 14.35$	2.10
D	14.25	$7 + 0.55 \times 15 = 15.25$	-1.00

Fund	R_i (%)	$R_f + \sigma_i/\sigma_m (R_m - R_f)$	Return due to net selectivity (%)
A	16.75	$7 + 14.68/19 \times 15 = 18.59$	-1.84
B	21.63	$7 + 17.45/19 \times 15 = 20.78$	0.85
C	16.45	$7 + 10.21/19 \times 15 = 15.06$	1.39
D	14.25	$7 + 11.22/19 \times 15 = 15.86$	-1.61

Fund	Return due to extra diversifiable risk (%)
A	$-1.2 - (-1.84) = 0.64$
B	$1.28 - 0.85 = 0.43$
C	$2.1 - 1.39 = 0.71$
D	$-1 - (-1.61) = 0.61$

Fund manager of Alliance equity fund has exhibited superior stock selection skills followed by the fund manager of HDFC Equity Fund.

4.

a. Duration of pension liability

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Year (n)	C.F	PVIF at 11.5%	PV (CF)	$n \times PV (CF)$
1	—	—	—	—
2	—	—	—	—
3	—	—	—	—
4	—	—	—	—
5	15,000	0.580	8700	43500
6	15,000	0.520	7800	46800
7	15,000	0.467	7005	49035
8	15,000	0.419	6285	50280
9	15,000	0.375	5625	50625
10	15,000	0.337	5055	50550
11	15,000	0.302	4530	49830
12	15,000	0.271	4065	48780
13	15,000	0.243	3645	47385
14	15,000	0.218	3270	45780
15	15,000	0.195	2925	43875
16	15,000	0.175	2625	42000
			$\Sigma PV (CF) = 61530$	$\Sigma n \times PV(CF) = 568440$

Duration = 9.2384 years.

Present value of deferred payments = Rs.61,530

If w is the weight of the 4 year zero coupon bond in the portfolio

$$4w + 13(1 - w) = 9.2384$$

$$4w + 13 - 13w = 9.2384$$

$$3.7616 = 9w$$

$$w = 0.41795 \sim 41.8\%$$

$$13 \text{ year bond} = 100 - 41.8 = 58.2\%$$

$$\text{Investment in 4 year bond} = 0.418 \times 61,530 = \text{Rs.}25,719.54$$

$$\text{Investment in 13 year bond} = 0.582 \times 61,530 = \text{Rs.}35,810.46$$

5. a. Investor who has gone long the index at 4144.2.

Day	Settlement price	Opening balance	Mark to market	Margin call	Closing balance
1	3984.20	15,000	(8,000)	8,000	15,000
2	4214.85	15,000	11,532.5	—	26,532.5
3	4290.00	26,532.5	3757.5	—	30,290
4	4153.85	30,290	(6,807.5)	—	23,482.5
5	3877.30	23,482.5	(13,827.5)	5,345	15,000
6	4071.50	15,000	9,710	—	24,710
7	4115.50	24,710	2200	—	26,910
8	4222.00	22,510	5325		27,835

Net profit/loss = (8,000) + 11,532.5 + 3,757.5 + (6,807.5) + (13,827.5) + 9,710 + 2200 + 5325 = 3890

- b. Investor who has gone short the index at 4144.2.

Day	Settlement price	Opening balance	Mark to market	Margin call	Closing balance
1	3984.20	15,000	8,000	—	23,000
2	4214.85	23,000	(11,532.5)	—	11,467.5
3	4290.00	11,467.5	(3757.5)	7,290	15,000
4	4153.85	15,000	6,807.5	—	21,807.5
5	3877.30	21,807.5	13,827.5	—	35,635
6	4071.50	35,635	(9,710)	—	25,925
7	4115.50	25,925	(2200)	—	23,725
8	4222.00	23,725	(5325)	—	18,400

Net profit/loss = 8,000 + (11,532.5) + (3,757.5) + 6,807.5 + 13,827.5 + (9,710) + (2200) + (5325) = (3890)

Section C: Applied Theory

6. Management And Performance

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Good management is certainly crucial for stock funds, but some people do not think so. Good bond managers can produce incrementally superior results and will keep their funds at the top of the pack. Thus, it is important to know who the manager is, how long that individual has been at the helm, and what philosophy he or she follows. The past performance can be evaluated in terms of variation of returns, which can be measured by standard deviation. By studying the past volatility of a portfolio's total returns one can gain a pretty good feel for its likely future course. Standard deviations can be used to make comparisons with other bond portfolios.

Fund Costs

They are especially important for bond fund investors because fixed-income portfolios generally produce lower long run returns than stock products. The information on fund costs can be obtained from the quarterly or annual reports of the fund. Compare the fees and expenses of several funds having same investment philosophy, examine the portfolio's expense ratio over the past several years and choose that fund having the least cost.

Portfolio Turnover

As with stock funds, higher turnover translates into increased transaction costs, which are shouldered by fund investors. In the case of treasury and high-grade corporate bond products, transaction expenses will tend to be relatively low, even with an actively traded portfolio. But, if the fund holds positions in lower quality debt, high turnover can be a problem.

Fund Size

Generally, it is believed that bigger bond funds are better because they benefit from economies of scale and should have lower expense ratios. In addition, their managers may be able to make better deals since they trade in larger blocks of funds. This analysis makes sense for highly quality fixed-income portfolios. But smaller or medium sized funds may be suitable when investing in less liquid junk-bond securities. The reason being that these portfolios may be able to maneuver more easily. They could take meaningful positions in smaller junk issues without having to worry about affecting prices as such.

-Bond Fund Yields

A fund's yield or, more precisely its net income distribution rate is similar to the current yield on a stock or bond. It is based on the interest on interest or dividends paid, expressed as a percent of the net asset value. Capital gains are not included, since they are far more irregular and unpredictable than income. One can get a good feel for the past range

of a fund's yield by looking at several years' worth of information. Since the yields show the kind of return one can expect, it is most important to people looking for a monthly cash flow. These individuals should remember that a mutual fund's yield fluctuates.

PORTFOLIO CHARACTERISTICS

Portfolio Composition

Every prospectus mentions the investment objective and the type of securities that will form the portfolio composition of a particular fund. Investors should ensure that the target bond portfolio is being run in accordance with its investment policy, as outlined in the prospectus. To do this, examine the fund's holdings as listed in the annual and quarterly reports. The portfolio composition should be looked in general terms, without trying to analyze each issue's investment potential.

Quality Rating

Besides the portfolio composition, one should also look at the quality of securities constituting a portfolio of the fund. The quality can be determined by looking at the credit rating of individual securities and especially those forming the bulk of the portfolio. In India, credit rating is generally done by CARE, ICRA and CRISIL. The credit rating of the securities should not be less than 'A'. Since each drop in quality entails a commensurate increase in yield, gaining extra yield is relatively easy, but only by assuming higher credit risk. Many bond funds are reaching out for yield, in part to offset their higher expenses. However, when fund expenses and any sales charges are taken into account, purchasing the lower quality portfolio does not always translate into higher income to the investor.

Average Maturity

This is an important indicator of volatility. Funds with the longest maturities have the greatest interest rate risk. They will fall the farthest if rates move upward. Investors should be careful of long maturities during periods of low interest rates. While investigating maturities, it should be found out if the manager hedges with futures or options. This can help lessen the fund's exposure to interest rate risk. Thus, if an investor expects the interest rate to move upwards, he/she should go for that bond fund whose portfolio consists of securities of short maturities. The situation will reverse if the investor expects the interest rate to move downwards.

7.

CHANGE IN WEALTH

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According to the utility theory, the risk taking ability of the investor increases with increase in wealth. It says that people can afford to take more risk as they grow rich and benefit from its rewards. But, in practice, while they can afford, they may not be willing. As people get rich, they become more concerned about losing the newly acquired riches than getting richer. So, they may become conservative and more risk-averse. The fund manager should observe the changes in the attitude of *the investor* towards risk *and* try to understand them in a proper perspective. If the investor turns to be conservative after making huge gains, the *portfolio* manager should modify the portfolio accordingly.

CHANGE IN THE TIME HORIZON

As time passes, some events may take place that may have an impact on the time horizon of the investor. Births, deaths, marriages and divorces - all have their own impact on the investment horizon. There are, of course, many other important events in a person's life that may force a change in the investment horizon. The happening or non happening of the events will naturally have its effect. For example, a person may have planned for an early retirement, - considering his delicate health. But, after turning 55 years of age, if his health improves, he may not take retirement. He may extend the investment horizon, as he does not need annuities until he retires.

CHANGES IN LIQUIDITY NEEDS

Investors very often ask the portfolio manager to keep enough scope in the portfolio to get some cash as and when they want. This forces the portfolio manager to increase the weight of liquid investments in the asset mix. Due to this, the amount available for investment in fixed income and/or growth securities that actually help in achieving the goal of the investor, gets reduced. That is, the money taken out today from the portfolio means that the amount and the return that would have been earned on it are no longer available to achieve the investor's goal.

CHANGES IN TAXES

It is said that there are only two things certain in this world - death and taxes. The only uncertainties regarding them relate to the date, time, place and mode. With taxes you have the additional aspect of the amount or rate. So, portfolio managers have to constantly look out for changes in the tax structure and make suitable changes in the portfolio composition. The rate of tax under long-term capital gains is usually lower than the rate applicable to income. If there is a change in the minimum holding period for long-term capital gains, it may lead to revision. The specifics of tax planning depend on the nature of income of the investor, and the nature of other investments.

BULL AND THE BEAR MARKETS

The fluctuations in the stock markets often provide opportunities for the investors in both positive as well as negative aspects. Say, when everything is going well, the markets also perform well, but during downtrends in the economies, the stock prices fall. Let us consider the period one where stock return is more than bond in contrast to the period two where the bond has better return than the stock. This provides the opportunity to buy stock at period one and sell the stock in period two to shift to the bond market. The above facts also apply to individual securities. It remains at the hands of the investors to protect themselves against discomforts that arise in the markets. This is possible only when the investors have proper knowledge and discipline in the investment process. The disciplined investment decisions provide value by providing the objective basis to confidently pursue uncomfortable investments.

THE CENTRAL BANK POLICY

It is to be always kept in mind that the central bank and the other banks enjoy a greater power in influencing liquidity in the capital markets. The stock market's demand for funds arises basically out of the money supply' growth and the underlying policy that determines it. The monetary and liquidity constraints finally influence a toll on the stock markets. Further, the monetary policy 'also has an immediate effect on the money markets, though it has less effect on long-term bond yields.

INFLATION RATE CHANGES

Inflation has its unique way of affecting the stock markets. As per the studies of Fama, unexpected changes in the rate of inflation may have its effect on pricing of stocks in either direction. When the inflation rate increases beyond expectations, the bond investors face a reduced real yield on the bonds. The nominal yield then rises so as to counteract the loss, and the bond prices fall. The unexpected changes in the inflation rate are also significant to the stock market returns. It is to be noted here, that the simple measures of inflation, such as Consumer Price Index (CPI), are not that reliable predictors of future returns on stocks and bonds. Alternatively the rates of changes in producer prices, which actually result in CPI inflation provides a better measure, and signals for future returns.

CHANGING RETURN PROSPECTS

It is assumed that other things being equal, the changes in prices accompany changes in the return prospects. With each negative fluctuation in the bond's price, its yield rises but its total return falls. For the equities, as price changes take place regularly, so do the return prospects. These changes eventually lead to the adjustments in the investor's portfolio. Bonds are both the most quantifiable as well as the least quantifiable of asset classes, for bonds which are downgraded by raters provide a better return prospect. A simple measure such as the slope of the bond market yield curve serves as an indicator of bond performance relative to cash equivalents.

THE TRANSACTION COST BARRIER

For all good reasons, transaction costs provide a jolt to the portfolio managers. These costs can never be recovered and their cumulative erosion value can at times be harmful. The very task of portfolio revision does not come free. Apart from the negative effect from the fees earned by brokers, the traders themselves can influence the security prices. The portfolio manager is expected to understand the trading costs and then to control or avoid them. It is to be mentioned here that transaction costs consist of more than just commissions. Market changes are observed, before and after the trade and even during the day. This may be another inadequate measure. The actual cost of transacting is the difference between the realized price and the price that must have existed in the absence of the order. Added to these, there can be trades that one seeks to carry-out, but fails to execute, which provides another tariff, an opportunity cost. Several research studies have tried to find the true transaction cost. But they could not realize their goals, because traders possess many skills and devising ways to win whatever game the portfolio managers try to impose on them. Trading costs are of the nature of an iceberg. The commissions rise above the surface, visible to the man. The part below the water reflects market impact of trades and those costs of the traders that were never incurred.

TRANSACTION MANAGEMENT

The modern portfolio theory aided with affordable computing power and new investment vehicles provides encouraging facts on trading costs. It tries to argue with the fact that trading costs are difficult to overcome. These innovations in finance made the program trade a credible alternative to traditional trade executions. If anyone trades without any basis, with the broker initiating a transaction without having seen the actual list of securities being traded, then the broker's bid may be overstating the actual value of the trade cost. Thus, a broker would be able to make some profits also.

TRADING'S POSITIVE SIDE

It is worthwhile to mention here that the traders provide liquidity to the markets, which is one of the prominent features of capital markets. Further, the commissions indirectly help in funding investment research, which adds to the efficiency that makes investment management a rewarding occupation. Added to this, rebalancing is a necessary aspect of portfolio management, so it should be done on a cost effective basis.

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